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From the Editor's Desk

The *Australian Orchid Review* is Australia's largest and oldest orchid periodical, and in 2019 embarking on its 84th year. It is also the largest orchid magazine that is privately owned and produced, as most similar publications are owned by national orchid bodies or larger botanical gardens. An increase in global paper and printing costs, along with a weakened Australian Dollar, has forced us into making a few changes to the magazine to remain relevant and viable. We know that by simply increasing the subscription rates is not the answer. Every time this is done, you lose a percentage of subscribers.

We did not want to use cheaper and thinner non-archive paper, cut corners in the printing process or be printed overseas. We pride ourselves on the overall quality of the *AOR*. We get many accolades for the lifelike colour reproductions and overall printing excellence, and the slick covers that Enviro Press Australia provides us. So we have reduced the number of pages from 64 to 52. This cuts both our production costs and slightly reduces our overall postage bill. We are proudly Australian owned and the magazine is also printed here. Caitlin and I, as co-owners, get immense enjoyment and satisfaction out of our contribution to the *AOR*'s 84-year history, yet we need to rethink some of our strategies. We are still selling magazines through newsagencies, but this may stop suddenly. Basically it's impossible to correctly predict and provide the exact number of copies of each issue to the countless newsagents we supply. Some get sold out on day one; others stay on the shelf untouched for two months. We lose money on every unsold copy, which we don't get back, and are destroyed. We can accept not making much money out of this glorified hobby (we both have other paying jobs), but we won't run at a loss. Having subscribers only, would stop such wastage and enable us the required number of magazines printed. We have no plans of going digital or online.

It would also help if the major orchid events supported us with advertising, instead of complaining that they don't always get a free mention! It's no surprise that the two biggest orchid events in Australia, the Melbourne Orchid Spectacular and the St. Ives Orchid Fair, have been consistent advertisers and supporters of the *AOR*. If people don't see your name out there they may think the event is no longer on. Orchid fairs charge vendors top dollar for their spots, and I'm sure nurseries expect some of that money to go towards advertising, not simply lining the organiser's pockets.

It is with much sadness that we report the passing of Brian Milligan. I knew Brian for over 25 years and he was a much respected mentor and friend of mine and many others. He was also tremendous support in my early days as Editor from back in 1999, and was a frequent writer for many years. If there were more people in the orchid world like Brian it would be a significantly friendlier, smarter and more enjoyable place.

More subscribers will keep our costs and subscription prices down. You can check your renewal date on the address flyer. It is getting ever closer to the time that we will no longer be selling in newsagents, so the *AOR* will only be available by subscription only. Support the nurseries and events that advertise with us. Show the magazine to orchid and gardening friends or your local society or club, encourage them to subscribe! As you all know, many longstanding and popular gardening magazines (such as *Your Garden* and *Burke's Backyard Magazine*) are no longer around, due to the digital/online age we live in. Yet these same people are all up in arms when such specialist magazines cease to exist. It's a two way thing; support the businesses (and magazines) that support the orchid fraternity. We also welcome original articles (with photos) for publication consideration. Maybe now is a good time to check if your subscription is still current. ☺ Remember you can subscribe or renew your subscription to the *Australian Orchid Review* online on our secure website at **www.australianorchidreview.com.au**

You can also visit our page on Facebook. ■

David Banks
Australian Orchid Review
david@hillsdistrictorchids.com

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Volume 84 – No. 1

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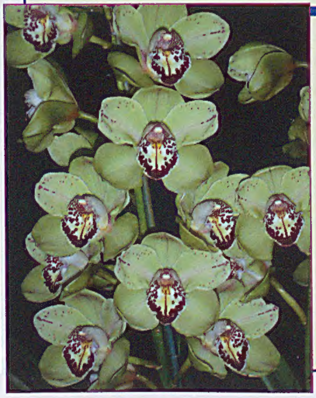

Cover Shot

Cymbidium Regal Solana 'Sequins'

owned and exhibited by master grower Brian Janes of NSW. (Photo: DPB)

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A Visit to the Melbourne Orchid Spectacular

Text and photos by Peter Rochfort

In 2017 I decided to take a trip to Melbourne to visit my good friend Mark Fowler and do a little sight-seeing as well as catching up with Richard Lee who was best man at my wedding. In the roughest landing I have experienced where the plane was "crabbing" down the runway with passengers gasping and screaming, the plane finally came to a halt to everyone's relief. This time the trip included a ride on the car ferry to Sorrento where we had a seafood lunch. Also on my itinerary was a visit to the COSV show in early September. I had not seen this show before so I was determined to do so this time.

In 2018 I took another trip to Melbourne to check out the Melbourne Orchid Spectacular and stay with my friend again for a few days. It's a long way from Craigieburn to the Dog Centre in Skye, especially with all the roadworks that were in progress. The trip was well worthwhile. The venue is huge unlike most of the show venues in Sydney, so there was plenty of room to move around comfortably. With any show I always check out the sales areas before looking at the show in case there are any "must buy" items which there usually are.

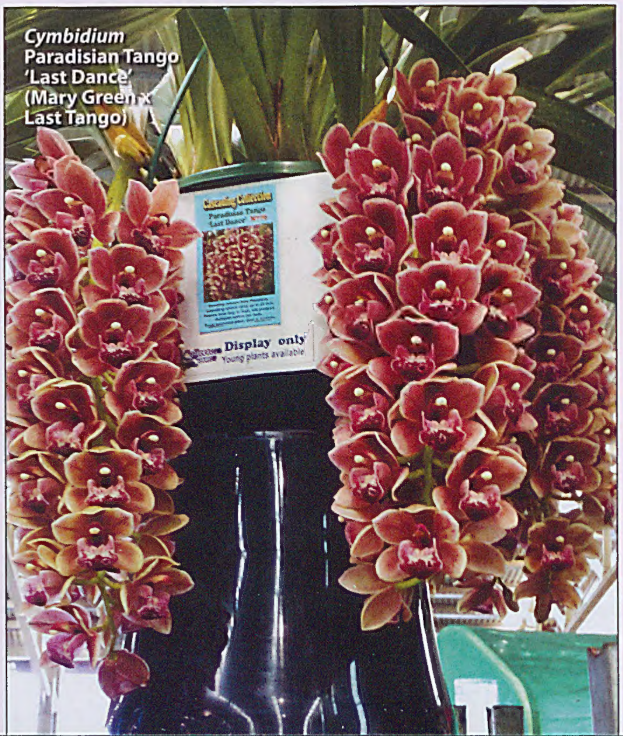
I'm sorry to say this, but I thought the sales area was more interesting than the show. There were crowds of visitors in the vendor areas and a minimal few in the show area. People seemed to be gravitating to the far end of the sales hall so I decided that I'd go and have a look. The vendor was Paradisia Orchids and the flowering pendulous plants were eye catching and quite stunning. There were shelves of mericlones of most of the plants, but needless to say many of the customers couldn't understand why they were unable to buy the plants in flower which were used to sell the clones.....derrrr.

I must admit that the clones were beautifully grown and flowered. To see them at their best they need to be grown into mature plants. Many were in the red, pink and brown shades although there were a couple of other colours. The clones were just about walking out of the booth, it was so busy. Naturally, I just had to purchase a small selection of these beautiful mericlones.

My next port of call was David Wain Orchids where I picked up a couple of most useful greens. There was certainly more variety than David had at the Sydney shows but it was a little later in the season, so that would have been expected. The irrepressible Lachie was run off his feet serving a crowd of customers.

To my delight I had a lengthy conversation with Dr Julian Coker from Atlantis Orchids. I had spoken to Julian on the phone several times but had never met him. He is one of the standouts of the old guard of *Cymbidium* growers and a national treasure. As he said, he is getting older and is cutting down on his collection...if only we could all be young again with the knowledge we have now. Ohhh...in a perfect world.

Among the other vendors who had comprehensive sales tables were Kimberley Orchids with an array of cut flower and pot plant types mostly in the white, pink and blush shades. I was fortunate to be able to have had a brief chat with Peter and Joyce Sunderland late that morning. The Sunderlands are another couple of the "old guard" and certainly national *Cymbidium* treasures. Their hybrids have gained numerous awards over the years. A nicer couple you couldn't hope to meet. I had a lengthy chat with Colin Gillespie, one of the "newer kids on the block" and with Clive Halls. We had an interesting chat about his *Cymbidium* days, long past, where I gained some useful new (to me), information. It made me realise just how much valuable information the older *Cymbidium* growers have and what a loss it is going to be to the *Cymbidium* community when they pass on and take the bulk of that information with them. I wish more of them would put their stories into writing before they are lost.



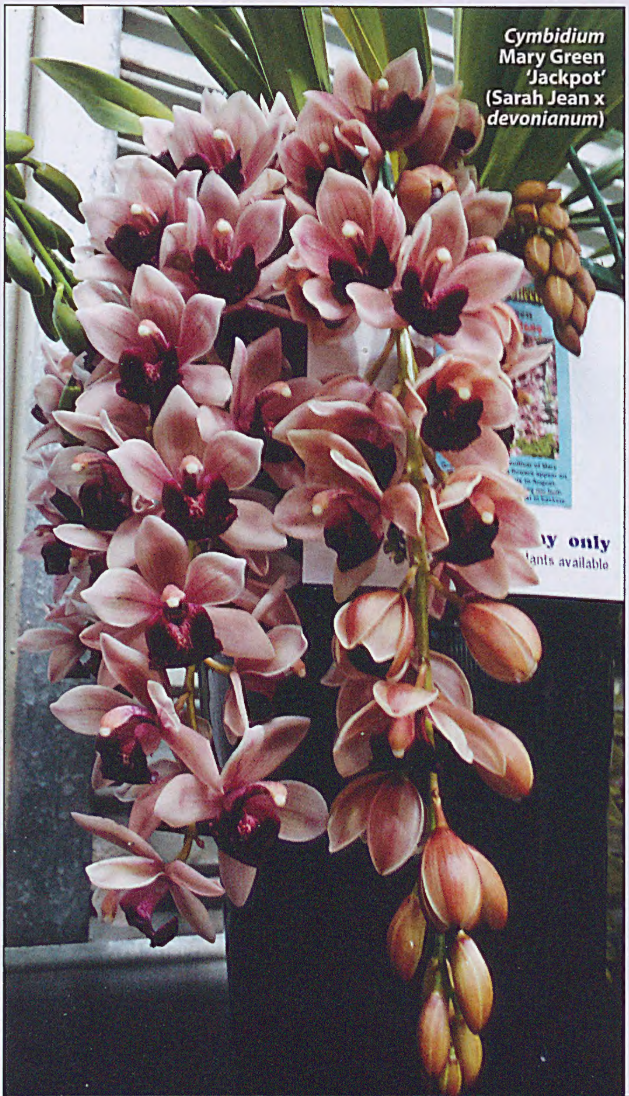
***Cymbidium* Paradisian Tango 'Last Dance' (Mary Green x Last Tango)**

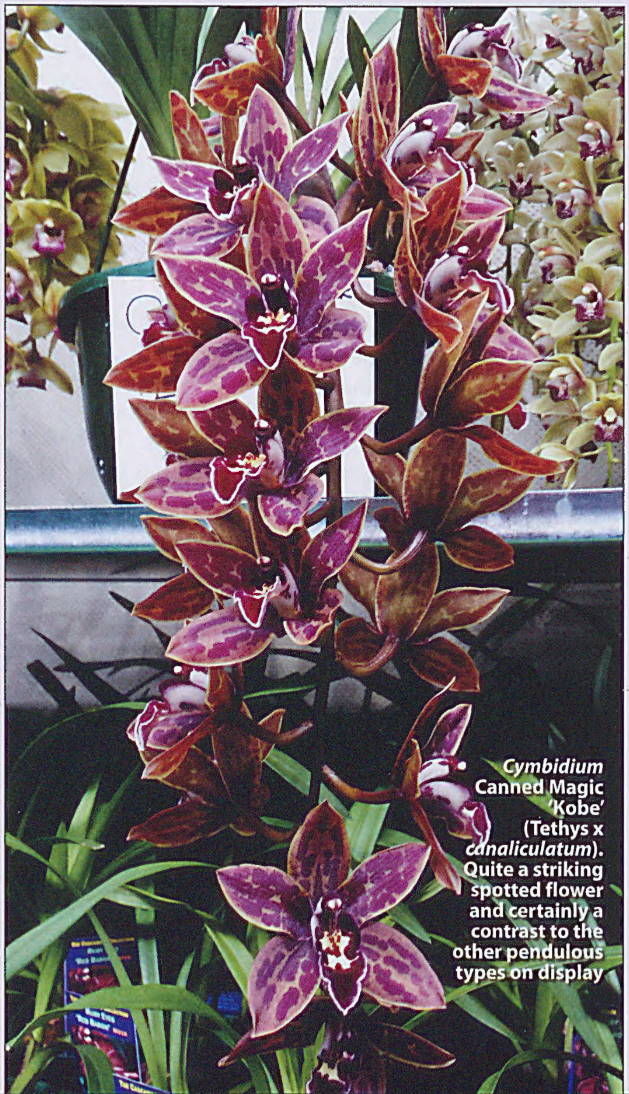
After a return run around the vendors' stalls, it was time to check out the Cymbidiums in the show. One of the problems with these types of displays is that the names of the plants, the exhibitor's names and the prize cards are quite often obscured by other plants or are too small to read at any distance. This was certainly the case here. At the other extreme the plant name cards in at least one of the displays were so large and obtrusive that they detracted from the overall effect of the display. My time at the show was limited so it wasn't possible to work out who owned what or which plant gained which prize in which class.

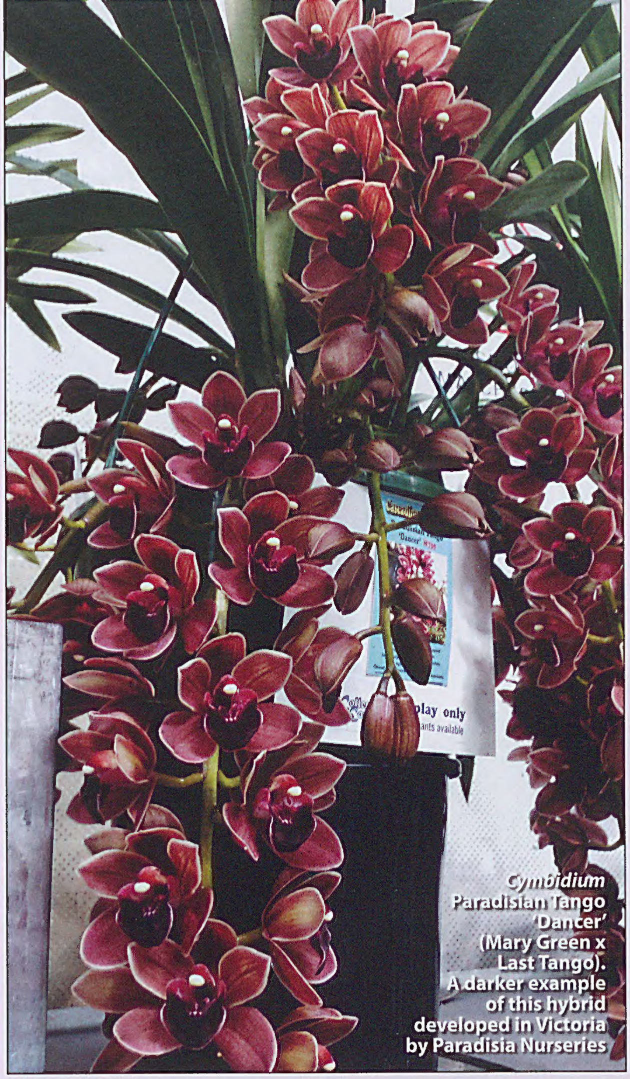
Having had major involvement in setting up displays over many years, one thing I have learned is that orchids look best in a natural setting. Although the displays at the St. Ives Orchid Fair are pretty much the same every year, the sheer time and artistic touch put into their construction makes them work perfectly every time. If a theme is going to be followed then "A Forest Glen", "A Waterfall Setting", "Mountains in the Distance", "Beside the Creek", and similar themes are going to work much better than "A Country Barnyard with Wheelbarrow and Well", "Orchids in Space", "Auntie Mary's Cottage" or "Orchids on A Cruise Ship Theme".

Over a period of many years I have seen some disastrous themed displays in which the props have had nothing to do with where you might see orchids, and have completely ruined the display. In some cases the props were so large and poorly constructed that the displays could have been called "Orchids Overcome by Awfulness." Placing which orchid where in a display can be crucial. The extremely large flowered, bordering on gross, *Cymbidium* Loch Watten 'Dural' was totally out of place and stuck out like a sore thumb at the top of one display. A position lower down and thoughtfully complemented would have been more appropriate. I cannot over-emphasise the importance and complementary effect that a range of quality foliage plants makes to the appearance of a display.

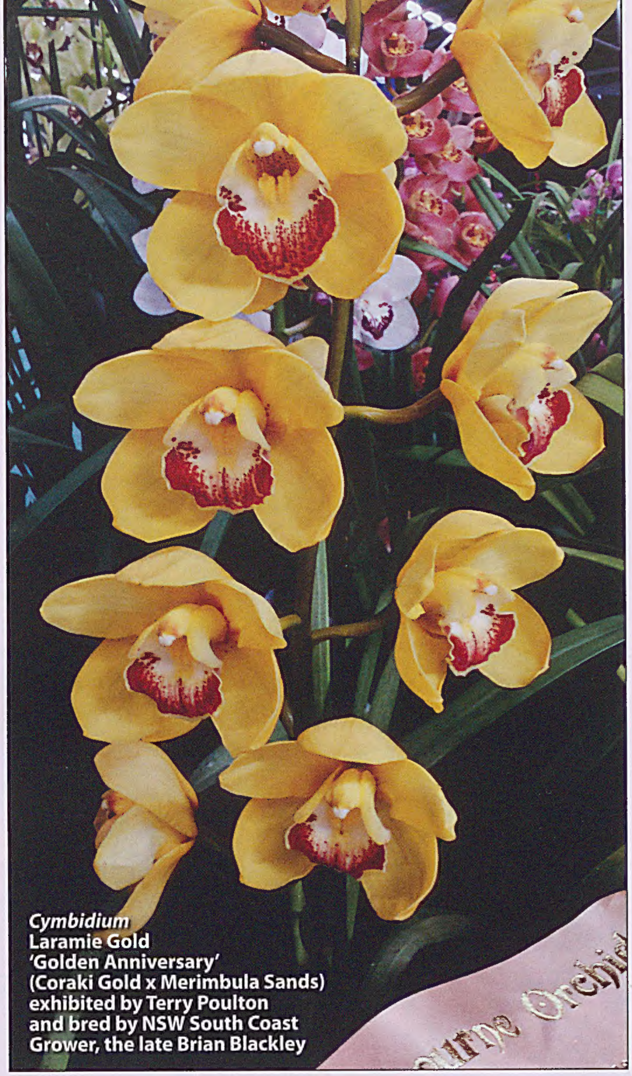
When I was in the United States in 1996, the artistry of some of the displays was quite an eye opener. Orchids were displayed in large picture frames, beautifully lit to advantage. There were natural settings featuring greenery, tortured willow, imaginatively placed rocky outcrops and other devices. Of course this type of display needs to be thought out well before the show and with the show in mind. If things are left until the last minute it definitely shows. Believe me, the public appreciate the Oohaah impact of a well thought out and executed display and in the case of commercial growers the name of their business will be remembered by the quality of their display. Enough.


Cymbidium Mary Green 'Jackpot' (Sarah Jean x _devonianum_)


Cymbidium Canned Magic 'Kobe' (Tethys x _canaliculatum_). Quite a striking spotted flower and certainly a contrast to the other pendulous types on display



Cymbidium Paradisian Tango 'Dancer' (Mary Green x Last Tango). A darker example of this hybrid developed in Victoria by Paradisia Nurseries



Cymbidium Laramie Gold 'Golden Anniversary' (Coraki Gold x Merimbula Sands) exhibited by Terry Poulton and bred by NSW South Coast Grower, the late Brian Blackley

By the time Mark and I left the event, his car was packed to the ceiling with our purchases of the morning. After ringing around I found that the least expensive way to get my plants back home was Australia Post, the same as last year. I spent a whole afternoon packing the plants in two large boxes, observing Australia Post's height and width limits. Never expect that there will be no damage. That is unrealistic given the size and weight of the plants. They were dropped off at the post office on the Monday after the show and arrived at Gosford Post office on Wednesday.

Being a lover of fine food, especially seafood, Mark decided that we would go to China Bar in Epping on the Saturday night. For $65 per head there is an "all you can eat smorgasbord" and a complementary glass of wine. After a dozen of the best tasting fresh oysters, a bug and a plate of sweet fresh prawns I decided to check out the hot buffet. Talk about quality! I have never had Chinese food this good, and I mean *never*. The only section I avoided was the deep fried this and that because of my medical condition. China Bar Epping will be on my list every time I visit Melbourne in future.

The flight back to Sydney was uneventful, thank goodness. I had plenty of time to reflect on the show and the five days I spent down south. I would highly recommend the event and the China Bar to those orchid growers who may be thinking of paying a visit to Melbourne in the future. ■

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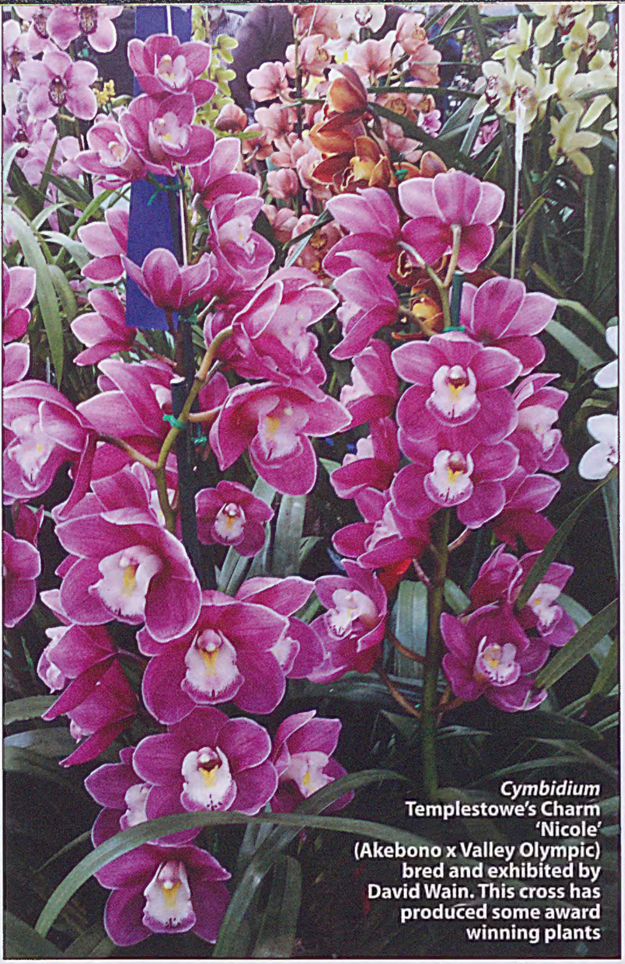
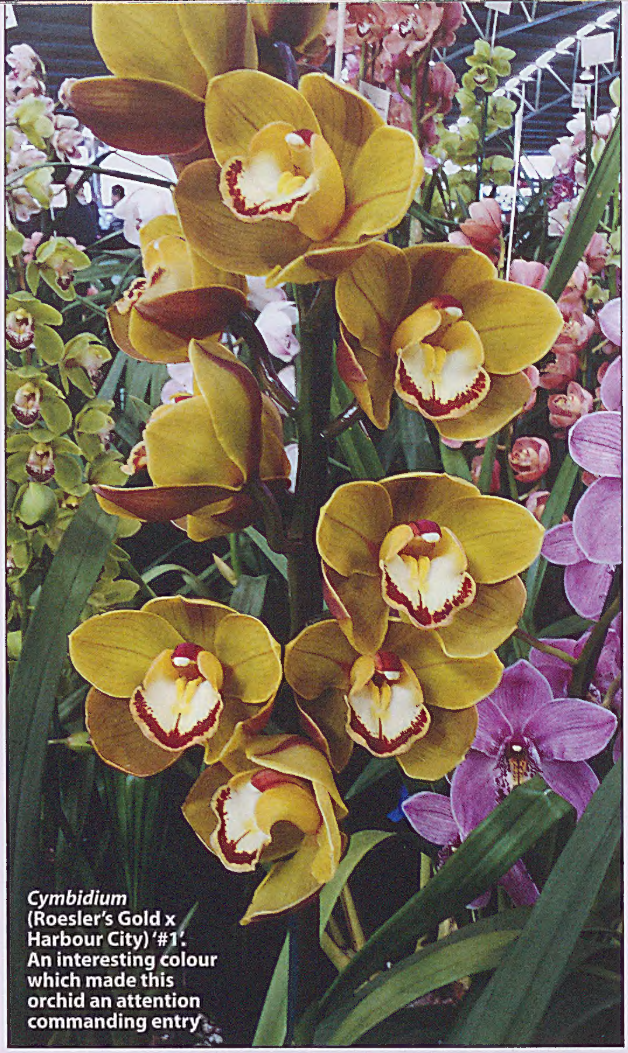
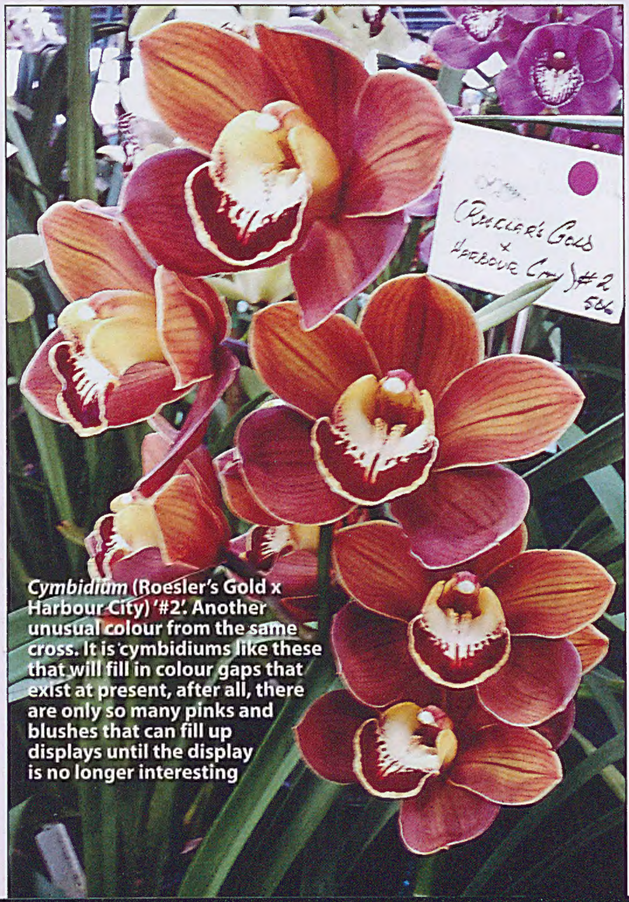


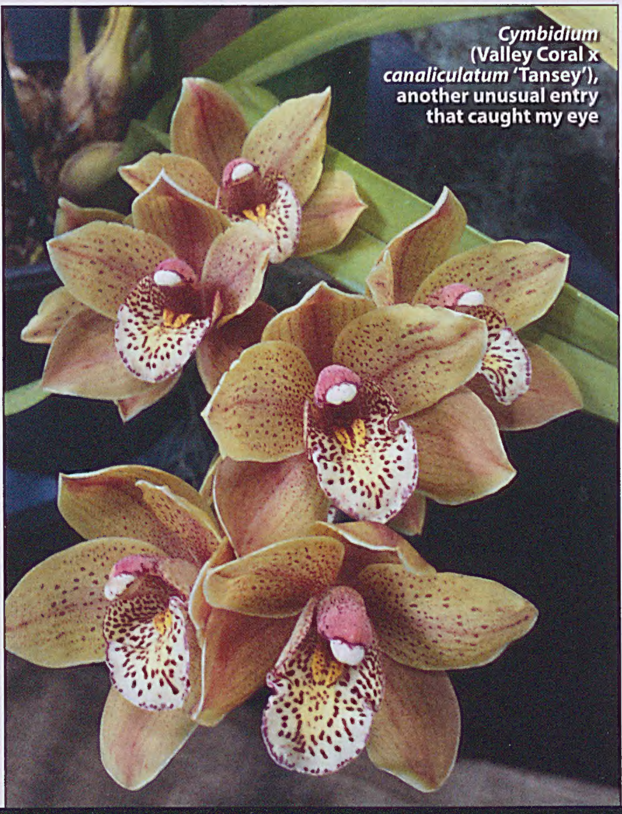
Cymbidium Templestowe's Charm 'Nicole' (Akebono x Valley Olympic) bred and exhibited by David Wain. This cross has produced some award winning plants



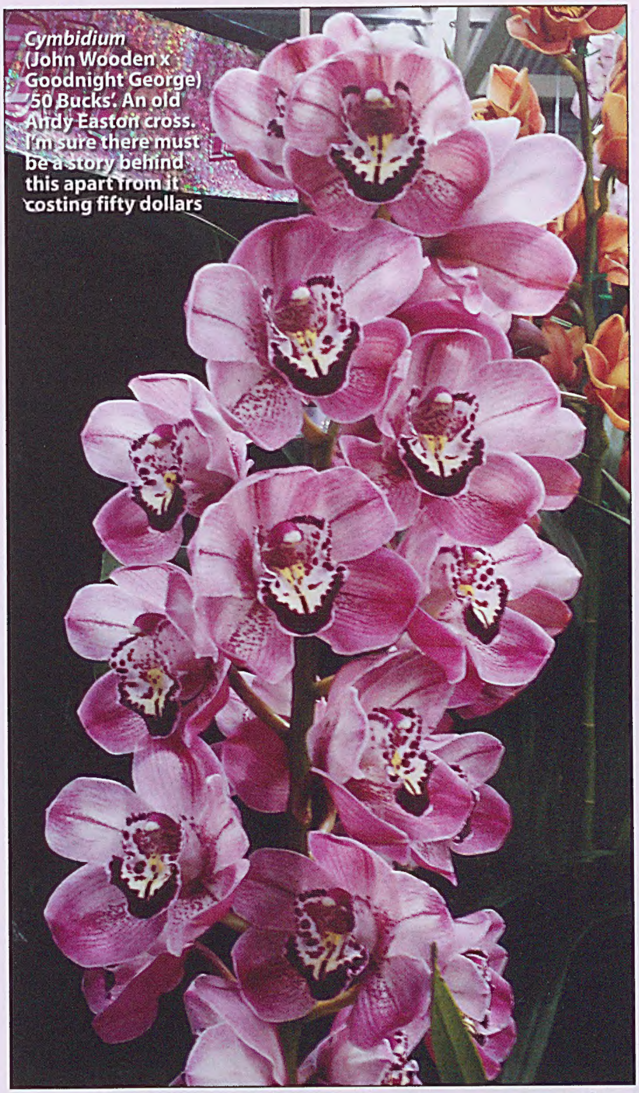
Cymbidium (Roesler's Gold x Harbour City) '#1'. An interesting colour which made this orchid an attention commanding entry



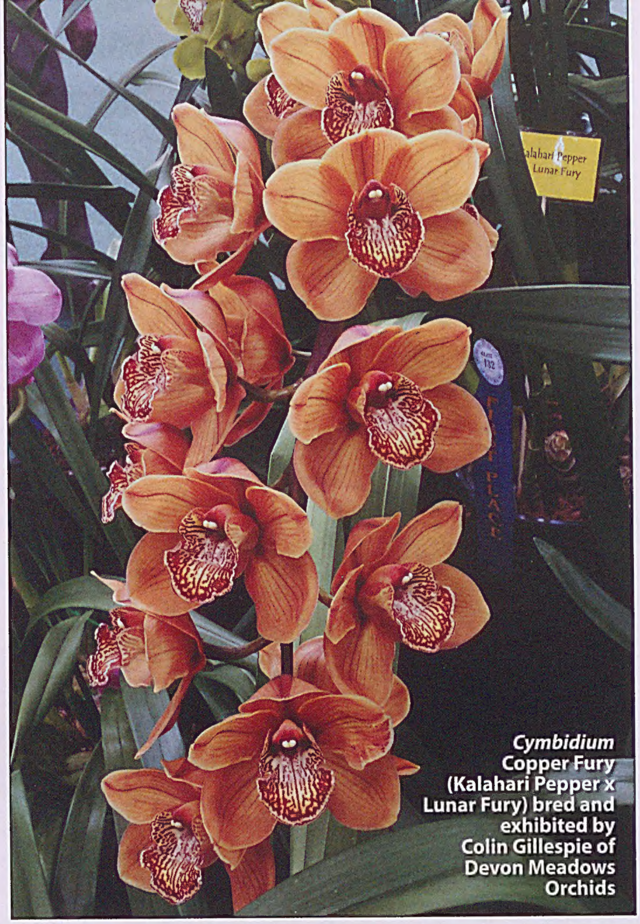
Cymbidium (Roesler's Gold x Harbour City) '#2'. Another unusual colour from the same cross. It is cymbidiums like these that will fill in colour gaps that exist at present, after all, there are only so many pinks and blushes that can fill up displays until the display is no longer interesting



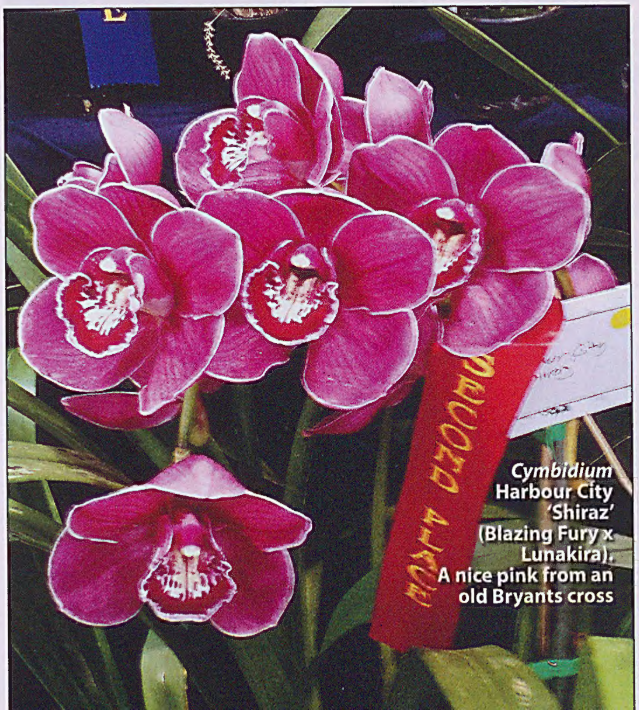
Cymbidium (Valley Coral x *canaliculatum* 'Tansey'), another unusual entry that caught my eye



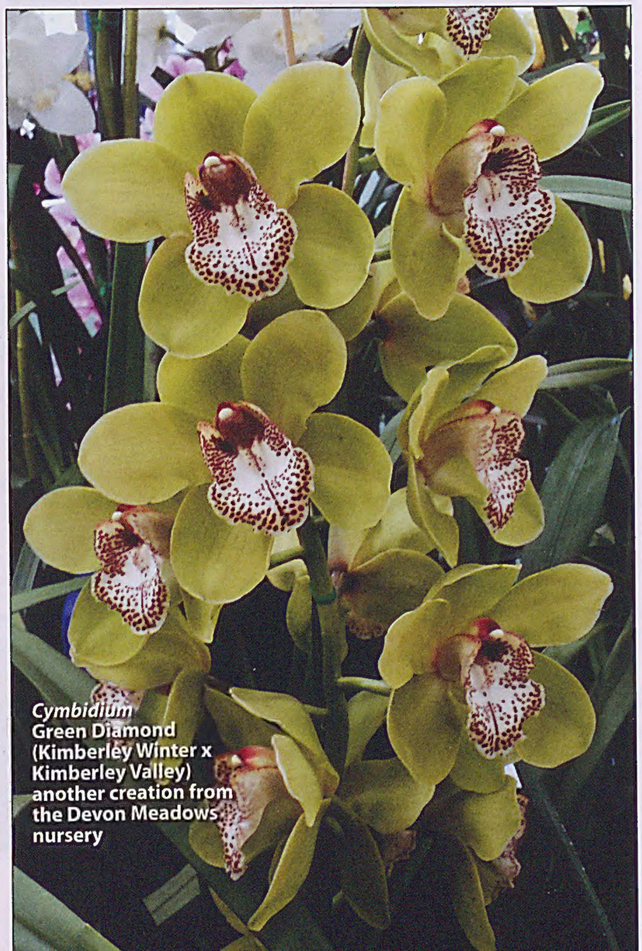
Cymbidium (John Wooden x Goodnight George) '50 Bucks'. An old Andy Easton cross. I'm sure there must be a story behind this apart from it costing fifty dollars



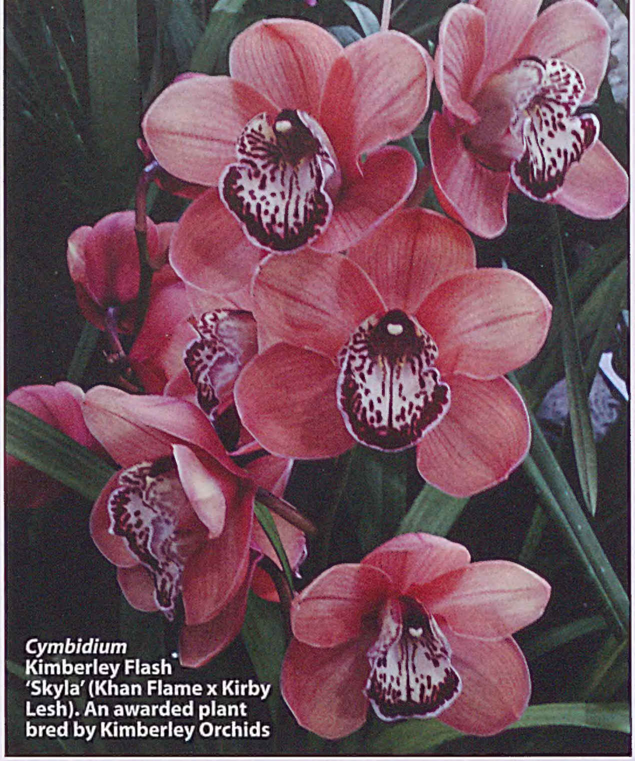
Cymbidium Copper Fury (Kalahari Pepper x Lunar Fury) bred and exhibited by Colin Gillespie of Devon Meadows Orchids



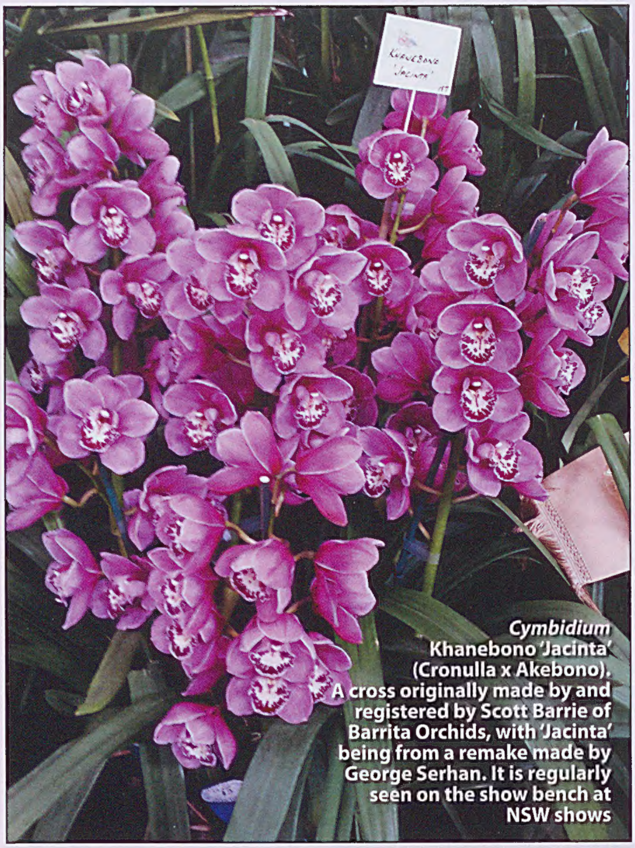
Cymbidium Harbour City 'Shiraz' (Blazing Fury x Lunakira). A nice pink from an old Bryants cross



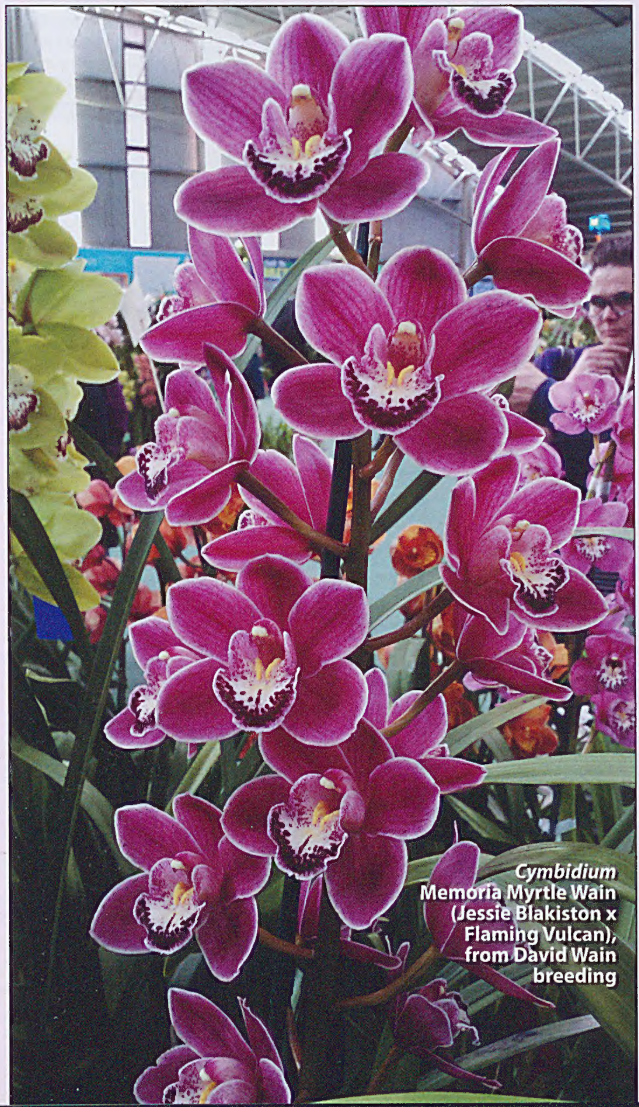
Cymbidium Green Diamond (Kimberley Winter x Kimberley Valley) another creation from the Devon Meadows nursery



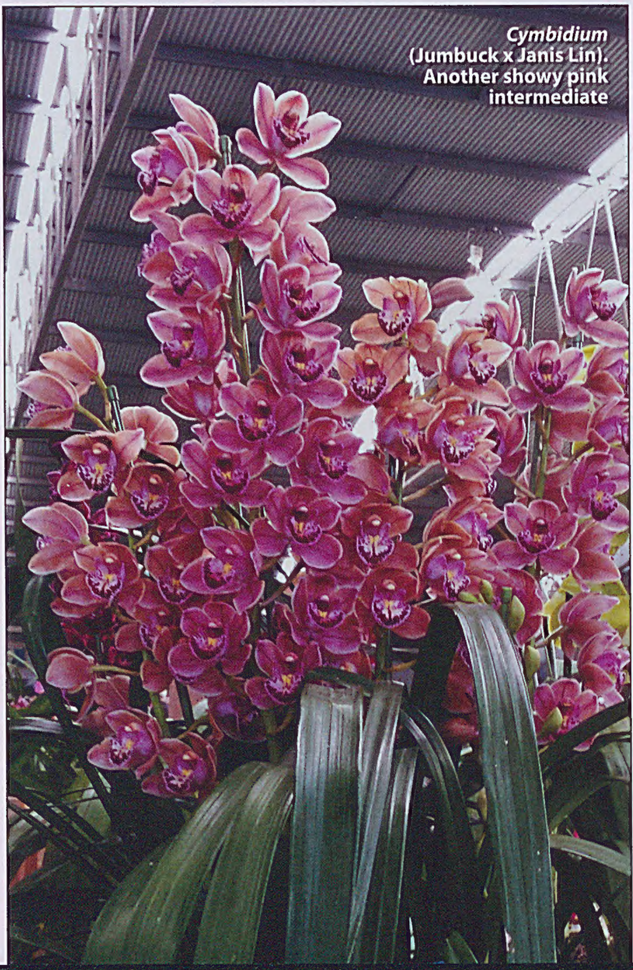
Cymbidium
Kimberley Flash 'Skyla' (Khan Flame x Kirby Lesh). An awarded plant bred by Kimberley Orchids



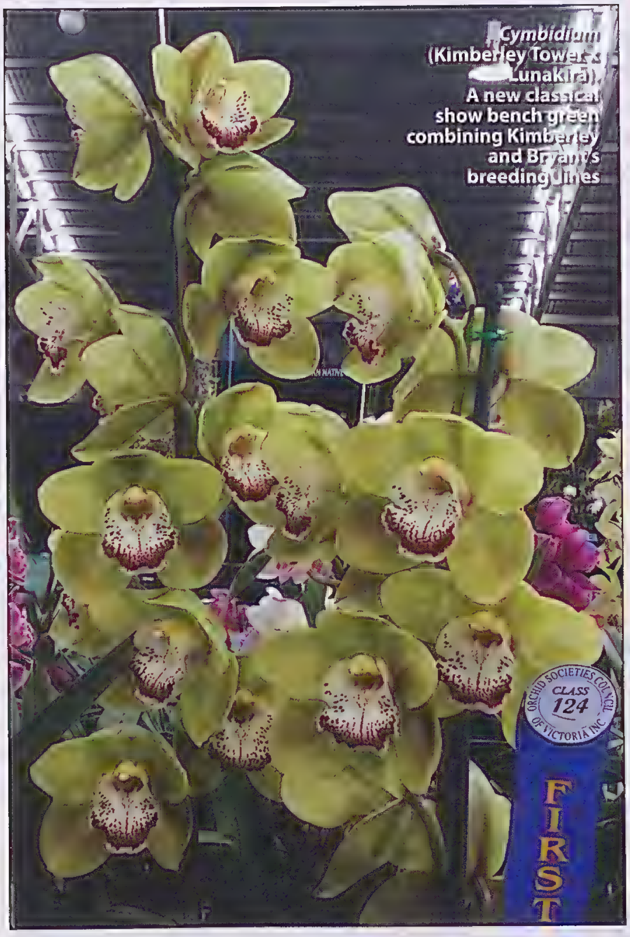
Cymbidium
Khanebono 'Jacinta' (Cronulla x Akebono). A cross originally made by and registered by Scott Barrie of Barrita Orchids, with 'Jacinta' being from a remake made by George Serhan. It is regularly seen on the show bench at NSW shows



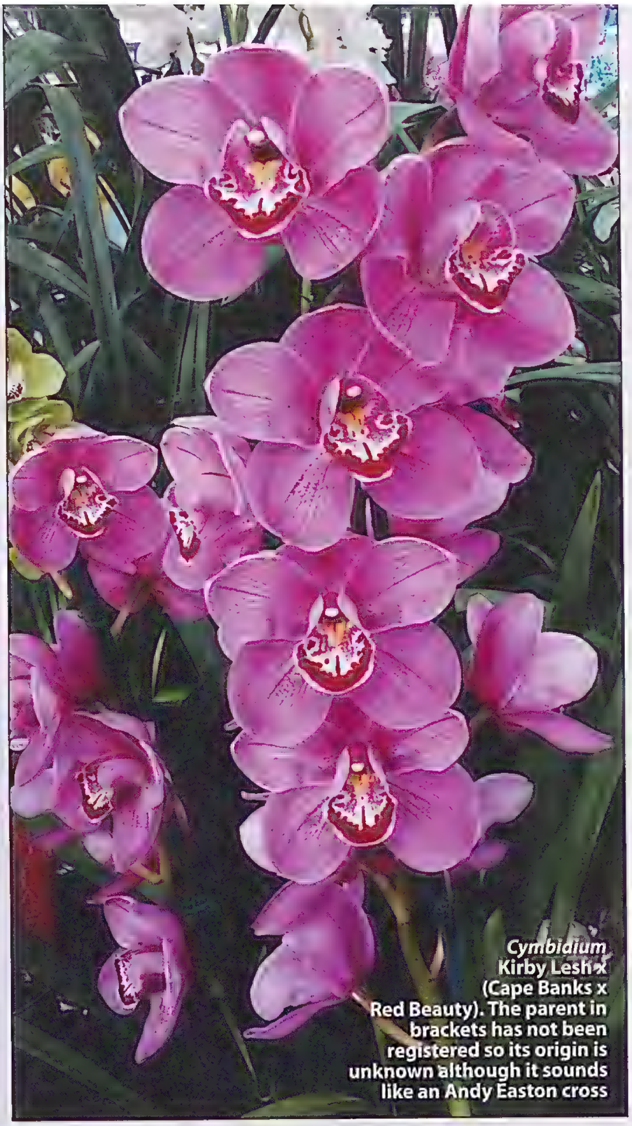
Cymbidium
Memoria Myrtle Wain (Jessie Blakiston x Flaming Vulcan), from David Wain breeding



Cymbidium
(Jumbuck x Janis Lin). Another showy pink intermediate



Cymbidium (Kimberley Tower x Lunakira). A new classical show bench green combining Kimberley and Bryant's breeding lines



Cymbidium Kirby Lesh x (Cape Banks x Red Beauty). The parent in brackets has not been registered so its origin is unknown although it sounds like an Andy Easton cross

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2018 – a poor flowering season in Sydney for *Sarcochilus* orchids. Is the worst still to come?

by K. Yin Chan and Sau-wan Chan

Introduction

"I doubt that anywhere in the world a genus of orchids has advanced in popularity more quickly than the genus *Sarcochilus* in Australia."

When W.T. Upton wrote these words in the Introduction of his book on *Sarcochilus Orchids of Australia* in 1992, there were 57 registered hybrids, now this has increased to 824 as of December 2018.

Sarcochilus orchids, both species and hybrids are popular amongst orchid growers.

In recent years, with the increasing availability of new hybrids of new and diverse colours and improved floral quality, orchid enthusiasts around the country keenly await the special shows featuring these orchids held during their peak flowering season. Such *Sarcochilus* (Sarcanthinae) shows have been around for over thirty years. In Sydney and the region around, these shows traditionally are held in October which corresponds to the peak flowering season of these orchids.

However, 2018 was an exceptional year for *Sarcochilus* orchids in the Sydney region. The Revesby Workers' Australian Native Orchid Club which hosts one of the largest shows of these orchids cancelled their annual show of these orchids for the first time. The reason given was poor flowering. Based on our experience and through talking to growers of these orchids in Sydney and the surrounding areas, flowering was both late and poor in terms of floriferousness. Based on our record, most of our flowering size *Sarcochilus* plants were late in flowering by about one month compared to previous years. As examples, two of our *Sarcochilus* hybrids which we have owned for a few years (*S.* George Colthup 'D-muscle' and *S.* Fitzhart 'Rusty Bucket') were both late in flowering by about a month and instead of producing half a dozen inflorescences as in previous years each managed only a single one this year.

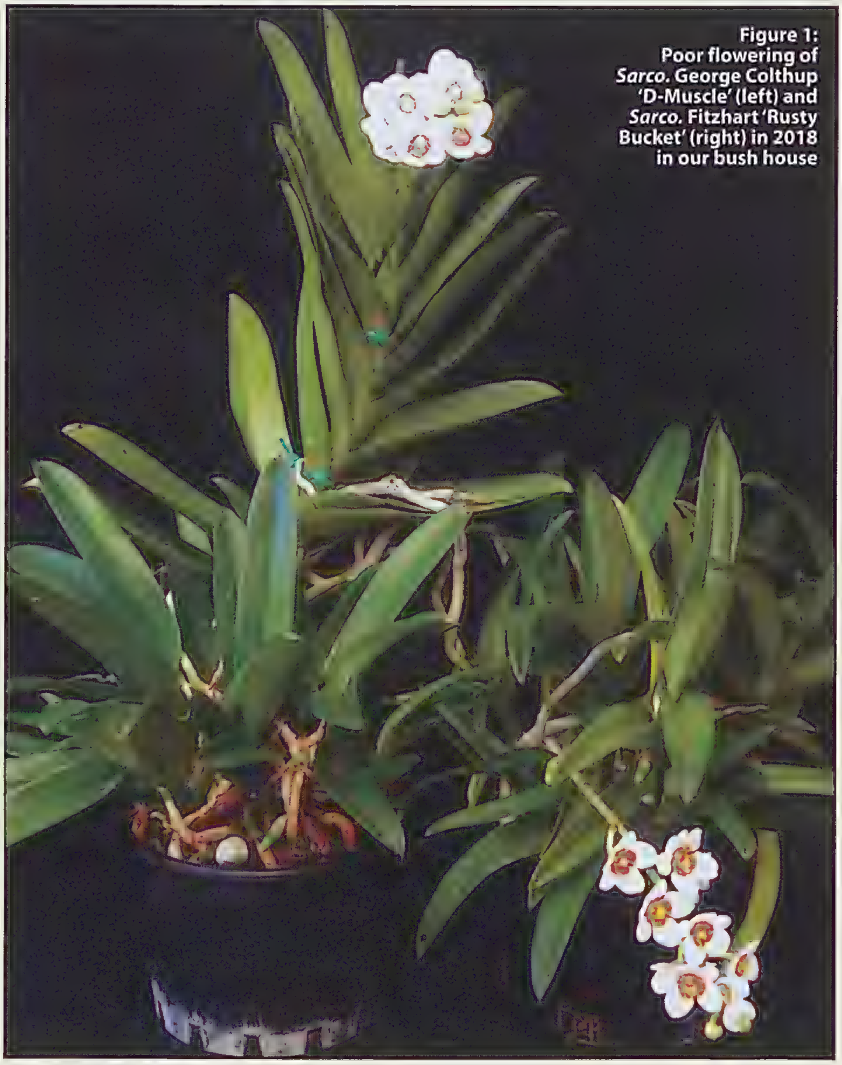

Figure 1: Poor flowering of *Sarco.* George Colthup 'D-Muscle' (left) and *Sarco.* Fitzhart 'Rusty Bucket' (right) in 2018 in our bush house

Growing *Sarcochilus* orchids in Sydney

Generally speaking, these orchids prefer cool, humid and shady locations with plenty of air movement. In Sydney, they are usually grown in shade houses. Active vegetative growth occurs in the cooler months of the year, i.e. spring and autumn. They don't grow much in summer and it is quite common to observe that in hot summer days, these plants quite often show signs of stress, namely shrivelling of leaves. It is stated that above 29°C, these orchids will stress and stop photosynthesis (Dengarden 2018). With the onset of cooler weather in early autumn, usually around April in Sydney, floral spike initiation occurs. The cooler temperature is apparently required as a signal to the plants to start the flowering cycle.

Below is a table showing the flowering time of some of the *Sarcochilus* species, most of which occurs in October/November. For the hybrids, this period also the peak flowering time for most of them because of their *S. hartmannii* and *S. fitzgeraldii* parentage (Chan and Chan 2014). 91% and 80% of the existing hybrids have either one or both of these species in their parentage.

Flowering time of some of the *Sarcochilus* species

(Source: Upton, 1992)

***Sarcochilus* species**	**Flowering time**
Sarcochilus hartmannii	September to November
Sarcochilus fitzgeraldii	October to November
Sarcochilus falcatus	October in NSW, July in North Queensland
Sarcochilus hillii	October to December
Sarcochilus olivaceus	October to November
Sarcochilus ceciliae	October to February
Sarcochilus hirticalcar	November to December

2018 Sydney – a year of record hot summer and warm autumn

According to Australian Bureau of Meteorology, summer 2017-18 in Sydney was hotter than average, with several heatwave events experienced during December and January. Several monthly and summer records were set for single hottest days, especially in the west of Greater Sydney. Overnight temperatures were also warmer than average over summer, with December being particularly warm.

Autumn of 2018 was the warmest on record for most sites in Greater Sydney. Sydney Observatory Hill experienced maximum temperatures of 25°C or more on 49 days this autumn, the most ever for autumn, and well above the autumn average of 20 days. In addition, rainfall was well below average across the region during this period, and the driest autumn at Observatory Hill since 2006.

To further investigate the effects of climatic conditions of the 2018 season in comparison to the long-term averages on the flowering of *Sarcochilus*, climatic data of one location (Parramatta North, Station number 066124 with 52 years of climatic data from 1967 to 2018) which is close to geographic centre of Sydney and to our home were analysed. The graph below presents the monthly average maximum and the monthly average minimum temperatures as compared to the long-term averages. In 2018, maximum temperature was higher than the long-term averages throughout the summer months. For December and January, it was respectively 3.3 and 2.8°C higher. The higher temperature persisted into autumn, particularly for April when the mean maximum temperature was 3.3°C higher than the long-term average. Furthermore, the minimum temperature in autumn months of March and April was higher than the long-term averages (Figure 2). With the combination of warm days and nights, many sites had their highest autumn mean temperature on record.

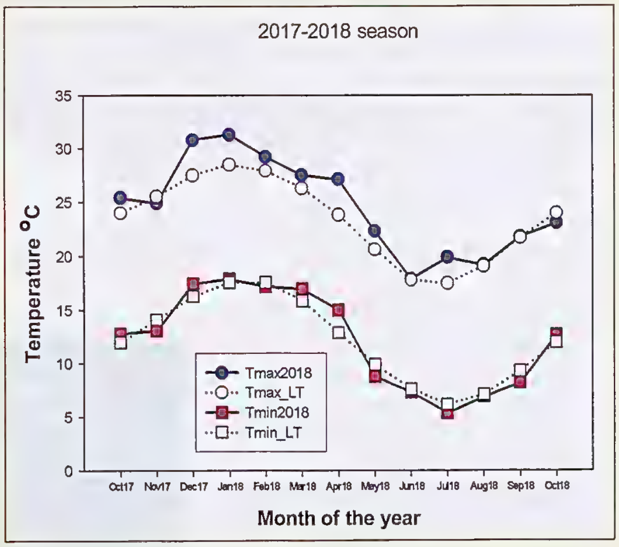

Figure 2: Monthly average maximum (Tmax) and the monthly average minimum temperatures (Tmin) in 2017/2018 season as compared to long-term averages (LT) (1967-2018)

Flowering season of *Sarcochilus* in 2018

Poor flowering of *Sarcochilus* in 2018 could most likely be attributed to significantly hotter summer and autumn. The hotter than long-term averages summer months would have an adverse impact on the growth and development of these orchids. Even though in most cases the orchids are grown in shade houses under irrigation, the drought conditions would also reduce humidity which is unfavourable to the growth of these orchids in the summer months. Therefore, both the abnormal temperature and rainfall conditions would have lowered the flowering potential of these orchids. The delay in flowering could be due to the abnormally warm months of March and April which has the effect of discouraging floral bud initiation which otherwise would have commenced in normal years. A cool autumn is beneficial to the floral bud initiation and the development of inflorescences.

Is the worst still to come?

Let us hope the climatic conditions experienced in 2018, particularly the warm autumn which was a new record was just an aberrant event. However, the reality is that summer has been getting warmer in Sydney in recent years (BOM 2016). As shown to the right, the long-term average of monthly maximum temperature in January is 28.6°C. On examination of the year-to-year data of Parramatta North in the past 52 years (1967-2018), there is a trend towards higher occurrence of hotter than long-term average temperature. In the first 10 years, there were 2-2.5 out of every 5 years with higher than long-term average. However, in the last ten years, there were 4 out of 5 hotter years. In recent years, some growers of these orchids in Sydney and Central Coast, NSW areas have found the need to put on three layers of shade cloths over their orchid houses during the hot summer days. If this trend continues, growing *Sarcochilus* would become marginal for the Sydney region. This is particularly true if we also encounter those above normal hot days in early summer, like in 2018 when there were 3 consecutive days in early November with temperature over 30°C bringing the flowering season to an abrupt end.

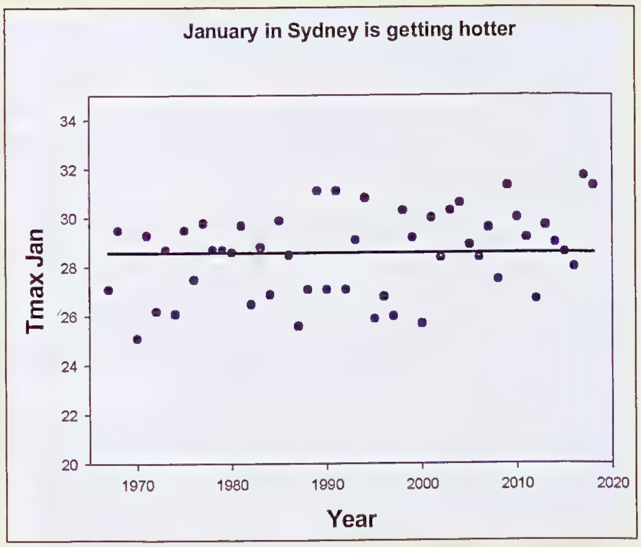

Figure 3: Monthly average maximum temperature in January (•) in the period 1967-2018 as compared to long-term average of 28.6°C (solid line)

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Australian Orchid Foundation – Awards of Honour for 2018

The Australian Orchid Foundation awarded two Awards of Honour for 2018 at the AGM on 26th October 2018, one very sadly being a posthumous award, in that Brian Milligan died just one week before the AGM.

Firstly Julian Coker. A copy of his nomination follows. The citation of his Award was framed and presented to him on the day.

Secondly, the posthumous award to Brian Milligan. Likewise his nomination appears below, that was written and seconded by Alan Hope, Greg Campbell and myself. Sadly Brian had been battling cancer for the last two years and we desperately wanted him to live to receive his award. ■

Helen Richards
Chairman of Directors/Secretary
Australian Orchid Foundation
Email: aof@australianorchidfoundation.org.au

Julian Coker: Australian Orchid Foundation Award of Honour for 2018

Julian's interest in orchids started when he was about 10 years old, living with his parents in Young Street, Kew. His first orchid was the ever-reliable *Epidendrum radicans* which he grew with great success. When he was 16, he diversified his collection by acquiring plants of *Cymbidium tracyanum, Laelia purpurata* and *Stanhopea nigroviolacea* which he also grew and flowered well.

His orchid hobby took a back seat whilst he studied Science and Teaching at tertiary level, to become a Science Teacher at Alexandra High School. He then decided that Medicine had more appeal and he completed a Medicine degree at Monash University in 1968.

Julian's orchid life took a huge leap forward around 1973 when he attended a Show put on by Warringal Orchid Society at Northland Shopping Centre. Impressed by the variety and beauty of orchids, he purchased about 50 *Cymbidium* back-bulbs to really start a significant collection. Unfortunately, as it turned out, most of those plants were both incorrectly named and virused, but the orchid bug had bitten him, and there was no turning back! Julian basically replaced his whole collection, and built a new glasshouse with three temperature zones to grow the various new genera he then acquired.

Julian's thirst for orchid knowledge was significant, and he spent countless hours talking and learning about orchids with renowned luminaries including Philip Cribb, John & Melita Gulbis (from Cecil Park Orchids), Alan Merriman, Andy Easton (from Geyserland Orchids) and Alvin Bryant.

Around this time Julian discovered his interest in orchid judging. He joined the Victorian Orchid Club/Australian Orchid Council (AOC) Panel as a trainee Judge and fairly became Victorian Registrar of Judging around 1980, a position he held for 6 years. In recognition of his abilities as an orchid Judge and administrator of judging systems, Julian was elected as Registrar-General of judging for the AOC in 1986, a position he also held for 6 years. With Graeme Banks as his Deputy, Julian re-wrote the AOC Judging Handbook and presided over a very successful period in Australian orchid judging. During this time, he established and authored for 3 years the Registrar-General's report for the AOC publication *Orchids Australia*.

Julian's progression into orchid administration began in the late 1970s when, noting that the outer-Eastern region of Melbourne needed a new Society, he co-founded Maroondah Orchid Society in 1978 and became its foundation member, as well as presenting the main talk at its first six meetings.

In 1992 Julian formed the view that a change in direction in orchid administration was needed in Victoria, and he led the movement that created the Orchid Societies Council of Victoria (**OSCOV**). OSCOV quickly became the primary peak body for orchid societies in Victoria, with around 25 of the 30 Victorian societies deciding to affiliate with OSCOV. Julian was President of OSCOV for the first 6 years of its existence, and his contribution to OSCOV's creation and success was ultimately recognised in 2016 when he was appointed as its first Patron after a community vote on the appointment.

Julian was one of the 2 initial Emeritus Judges of OSCOV, along with Gunter Haar. Julian wrote the OSCOV Judging Handbook and introduced 'appreciation' judging as the primary OSCOV approach, an approach which OSCOV still uses, and many other Panels have since adopted.

Julian has always been a very strong supporter in the establishment of the Victorian orchid community. He has been a foundation member of Maroondah Orchid Society, the Cymbidium Orchid Society of Victoria, Southern Suburbs Orchid Society, North East Melbourne Orchid Society, the Orchid Species Society of Victoria, and Ringwood Orchid Society. He has been guest speaker on hundreds of occasions at Victorian Orchid Societies, and he has spoken at other Orchid Societies in every Australian State.

In the international context, Julian has represented the Australian orchid community on many occasions. He judged at the World Orchid Conferences at Auckland in 1990 and Glasgow in 1993. In addition, at the Auckland WOC he was one of the International Speakers, presenting a paper on albinism inheritance in orchids.

Julian has written countless articles on orchid-related topics for publication, particularly in the 6-volume *Orchids in Victoria* series. His articles have included 'Australian Native Orchids – An Overview', 'Seedlings and Mericlones', '*Cymbidium* Pacesetters', 'Cymbidiums and Frost', '*Lycaste* – The Beautiful One', 'Colchicine Conversion' and '*Cymbidium* Culture'. These articles are regularly referred to by orchid growers and are still to this day often reproduced in Society newsletters.

Also in the late 1970s, Julian realised that Medicine was not what he wanted to spend his life pursuing, orchids were much more interesting. He established Atlantis Orchids in 1977 and built that nursery up to be one of the largest and most respected in Victoria. Atlantis Orchids started as a back-yard hobby, grew to a number of large shadehouses at the Plant Growers Australia site in Brushy Creek, before being relocated to its primary site in South Warrandyte. Atlantis Orchids specialised in cold/cool-growing genera.

Julian has also dabbled in hybridising orchids, primarily Cymbidiums and Lycastes. Many people will be familiar with the famous *Cymbidium* Second Renaissance 'Jenny Wren' (which was awarded a Silver Medal at the Auckland WOC) and the various *Lycaste* Macama (including the 'Jenny Wren', 'Aline' and 'Atlantis' cultivars, the latter of which was awarded an AM/OSCOV in 2009).

With his wife Frances, Julian has won numerous categories in the OSCOV Victorian Orchids of the Year including *Odontoglossum*/Oncidiinae of the Year in 2004, 2005, 2006, 2007, 2011 & 2012, Any Other Hybrid of the Year in 2007 & 2012 and Award of Distinction of the Year in 2012 & 2014.

Other achievements for which Julian is well known include:

- Developing the Atlantis Orchids 'SuperBrew' fertiliser. With his strong background in Science, in the early 1990s Julian set about creating a general-purpose fully-balanced fertiliser that orchid enthusiasts could reliably purchase and use. It took over 3 years to perfect the formula, but SuperBrew is now used by many people in Victoria and interstate with great success; and
- Producing the educational DVDs '*Cymbidium* Repotting', 'Cold-growing Orchids' and 'Orchid Pests and Diseases', each of which has been widely viewed in the orchid world.

Julian is without doubt one of the elder statesmen of the Victorian orchid community, much loved and universally respected for his contributions to generations of orchid enthusiasts. ■

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Brian Milligan: Australian Orchid Foundation Award of Honour for 2018

Brian's interest in orchids began soon after he and Lorraine married in 1958, when they made frequent trips to Anglesea and the Grampians to find and photograph native terrestrial orchids. They visited Les Nesbitt in Adelaide and purchased their first terrestrial orchids which led to invitations to speak on native orchids and then many other orchid subjects to local, country and interstate orchid societies.

Brian began growing Cymbidiums over 50 years ago when the manager of the plant stall at their local scout fete gave him some struck *Cymbidium* back-bulbs that had failed to sell during the day. But it was not until February 1984, when he attended his first orchid meeting at Warringal Orchid Society (Heidelberg) that he became 'hooked' on orchids in general. He was amazed at the plant display because, until then, he had no idea that one could have orchids in flower at that time of year. Two weeks later he joined the Ringwood Orchid Society because he couldn't wait another month to see more orchids in flower! Within a few years he and Lorraine were members of six societies.

They soon acquired a heated glasshouse and assembled a collection of both cool- and intermediate-growing orchids. Their main interests at first were Cymbidiums and Australian native Dendrobiums, *Sarcochilus* and terrestrials but then they gradually accumulated a large collection of Disas and Masdevallias. Today their main interest is in growing species orchids, particularly those from overseas countries.

In late 1992 Brian was invited to become a member of the steering committee that led to the first meeting of the North-East Melbourne Orchid Society (NEMOS) in March 1993, and was appointed Editor of its monthly newsletter, The NEMOS News (*TNN*). He continued in that role for a further 24 years (292 issues) until he retired due to ill health. He also held the position of Vice-President for many years as well as one year when he was the Society's second President.

Prior to becoming editor of *TNN* he had contributed articles for several other newsletters, his very first *In Defence of Greenhoods* being written in the 1980s in response to an article by Maurie Black (then editor of the Warringal Orchid Society's newsletter), in which he referred to greenhood orchids as lawnmower fodder.

When the Orchid Societies Council of Victoria (OSCOV) was inaugurated in 1993, Brian became involved. In the mid-90s he succeeded Issy Klein as Liaison Officer on the OSCOV executive committee, his main duties being preparation of the annual show judging rosters and writing articles for use in various OSCOV member society bulletins. In more recent years (2000 – 2008) these and other articles were published in book form (6 volumes of the *Orchids in Victoria* series) under joint editorship with Alan Hope. Some of his articles were also published in the national orchid journals, at first in *Orchids Australia* and then, from 1999 when David Banks became Editor, in the *Australian Orchid Review*.

Between 1998 and 2007 he took on the position of editor of the annual *Journal of the Orchid Species Society of Victoria*, a very informative journal, again with Alan Hope. This publication ceased when John Varigos took over the role of editor of the *OSSV Newsletter* making the publication redundant.

Brian has been a keen background researcher on plants' habitats and history in cultivation. He knows all the old publications and where to find a Victorian lithograph when required. He also managed the Orchid Species Society of Victoria's (OSSV) extensive database of plants benched from inception until only a few years ago. He kept the register up to date and reconciled benched names against the Kew accepted name following each meeting.

Brian has been happy to volunteer for plant commentaries at OSSV meetings and the quality of his benched plants attested to his cultural skills.

He was a student orchid judge of the VOC. He became a judge (later elevated to Emeritus Judge) of the OSCOV Judging panel.

In 1996, he was invited to become an Associate to the Directors of the Australian Orchid Foundation. In 2000 he became a Director, a position he held for the next 6 years until he retired to make way for a younger person. During that time he was very willing to take on any task, fully supporting the Foundation's work, looking for improvements, and reorganising the record keeping of projects supported, going back over 20 years of records and summarising their details for ease of reference in future years.

Brian has been a tireless worker in promoting orchids in Australia. His desire to impart knowledge led to prolific writing which has educated several generations of orchid growers and his articles continue to be reproduced in orchid journals today.

Sadly, Brian Milligan passed away on 21 October 2018. ■

Brian Milligan
(1931 – 2018)

Brian Milligan was born in Toowoomba, Queensland in October 1931, but when he was only 5 years old, he and his mother moved to Adelaide where, spending all his school and university holidays working in the family market garden, Brian discovered and nurtured his love of growing plants.

Once he finished secondary school, Brian commenced a Bachelor of Science degree at the University of Adelaide. Brian displayed such ability in his studies that he was awarded a scholarship to undertake the Bachelor of Science Honours course, and then another scholarship to complete a Ph.D. in organic chemistry. Ironically, bearing in mind the fact Brian chose his initial tertiary course because it was shorter than studying Medicine, Brian accepted a further scholarship from the CSIRO to study in Cambridge where he added another Ph.D. to his qualifications, as well as acquiring a fiancée, because it was in Cambridge where Brian met Lorraine (who coincidentally was also from Adelaide). Brian and Lorraine married upon their return to Adelaide in 1958.

Brian's CSIRO scholarship obliged him to work for the CSIRO for 3 years, but he actually stayed with the CSIRO for almost 30 years, by which time he held the grand title of Senior Principal Research Scientist in the wool textile research division, and led a team of about 20 scientists and technicians. Brian foresaw a natural decline in the need for his field of expertise, and in 1986 he applied for, and was granted, early retirement at age 55.

However, retirement from the workforce only meant that Brian had more time to devote to his passion for orchids. Although Brian and Lorraine had for many years made frequent trips to Anglesea and the Grampians to find and photograph native terrestrial orchids, Brian first began growing orchids himself around 1970, when the manager of the plant stall at his local scout fete gave him some struck *Cymbidium* back-bulbs that had failed to sell during the day. Once he was retired, like so many orchid growers, Brian started to squeeze more and more shade houses into the second Milligan property in North Balwyn, the first proving to be too small for Brian, Lorraine and their growing family, Andrew, Susan, Stuart and the orchids! Brian soon acquired a heated glasshouse and assembled a beautiful collection of both cool and intermediate growing orchids. His main interests at first were Cymbidiums, Australian Native Dendrobiums, *Sarcochilus* and terrestrials, but he and Lorraine gradually accumulated a large collection of Disas, Masdevallias and his main orchid passion, species orchids, particularly smaller growing species from overseas countries.

In February 1984 Brian attended his first Orchid Society meeting, and was quickly 'hooked'. Two weeks later he joined his second Orchid Society, and within a few years he and Lorraine were members of 6 Orchid Societies.

The next step in Brian's immersion into orchids was being accepted as a student orchid Judge by the Victorian Orchid Club, and then joining the judging Panel of The Orchid Societies Council of Victoria when it was formed in the early 1990s. Brian's proficiency with the art and science of orchid judging was ultimately recognised when he was appointed as an Emeritus Judge of the OSCOV Panel, an honour that has only been bestowed on 6 Judges.

In late 1992 Brian joined the Steering Committee that formed the North East Melbourne Orchid Society, and when it held its first meeting in March 1993, Brian accepted the position of Editor, a job that he performed admirably until July 2017, after 292 monthly issues. Brian was also the second President of NEMOS, and held the position of Vice-President of NEMOS for many years. In the mid-1990s Brian became Liaison Officer on the OSCOV Executive Committee, his main duties being the preparation of the annual show judging roster and writing articles for use in various OSCOV member society bulletins. From 2000 – 2008 these and other articles were published in book form (the Orchids in Victoria series). Some of his articles were also published in the national orchid journals *Orchids Australia* and the *Australian Orchid Review*. These same articles to this very day form staple content for so many Orchid Society bulletins in Victoria and interstate. Such was his interest in writing articles about orchids that between 1998 and 2007 Brian took on the position of editor of the annual *Journal of the Orchid Species Society of Victoria*. But not content with his numerous roles in the orchid world, in 2000, after serving for several years as an Associate to the Directors, Brian became a Director of the Australian Orchid Foundation, an organisation which distributes its earnings to worthy orchid research and conservation projects in Australia. Brian held that position for 6 years.

In July 2018 Brian said that when he first retired, an elderly neighbour told him that if he wanted a long, happy life, he should always keep busy. Brian made sure that he never had a problem in that regard, because as he said "if you make a full-time hobby of orchids, there's always something that needs to be done!"

I have known Brian ever since I became interested in orchids, which was around 45 years ago. I served with Brian on the Committee of NEMOS for around 10 years, and I spent many happy times judging orchids with him, and just talking about our shared obsession with orchids. Brian was an inspiration to me in the orchid world. His knowledge was unparalleled, his enthusiasm was uplifting, his commitment to his many roles was extraordinary, and his calm, gentle and professional demeanour was such that he quietly earned a universal reverence that might not be seen again in the Victorian orchid community for a long time.

Brian's passing will create a significant void in the lives of many orchid enthusiasts, but at least we can always be grateful that we are all the richer for having Brian in our lives. ■

Michael J. Coker
President, OSCOV
Email: MCoker@piperalderman.com.au

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Ezi-Gro Orchids, Western Australia

Kevin Butler with *Bulbophyllum echinolabium*

Ezi-Gro Orchids was established in 1987 at its current location of Darch (formerly Landsdale) on two hectares of land. Darch is about 20km north of the Western Australian capital city of Perth. Half of this area is used for the cultivation of orchids. Most of the buildings consisting of sheds, shade houses and glasshouses were built in the first ten years of development.

Most of the business involves the selling of orchid plants, locally, around Australia and overseas. This includes wholesaling and retailing. Ezi-Gro also sell some orchid flowers locally. Orchids for sale have been sourced from all over the world. Also an extensive gene pool of Cymbidiums, Paphiopedilums and Cattleyas has been put together and are used in our current breeding program.

Kevin Butler is the owner of Ezi-Gro Orchids, and has travelled extensively throughout Australia and overseas, often judging and/or lecturing. He has been a strong ambassador for orchids in Western Australia, especially Cymbidiums. Kevin has won many awards and championships with a range of genera in local and interstate orchid events. He has been growing orchids for many decades and has a wealth of knowledge and experience. ■

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New Combinations in Australian Orchidaceae

by David L. Jones and Mark A. Clements

1. *Diuris punctata* forma *blakneyae* F.M.Bailey was linked with *Diuris oporina* D.L.Jones when that species was described (Jones 1991). Subsequent reassessment of the brief description of *Diuris punctata* forma *blakneyae* and re-examination of the type revealed significant differences between the two taxa and a new combination is required. *Diuris punctata* forma *blakneyae* is late spring flowering with a distinct fan-shaped labellum midlobe with an elongated narrow basal neck. By contrast *Diuris oporina* flowers in autumn and has a wedge-shaped labellum midlobe with a broad basal neck.

Diuris blakneyae (F.M.Bailey) D.L.Jones, ***comb. nov.*** Basionym: *Diuris punctata* forma *blakneyae* F.M.Bailey, *Comprehensive Catalogue of Queensland Plants,* Plate 847, fig. 973 a,b,c (1913).

2. Two species of *Pecteilis* were left unaccounted for in a recent treatment of the genus (Clements & Jones 2018). *Habenaria halata* was named from a lowland swamp east of Darwin, but has been linked by some authors with *Habenaria eurystoma* Schltr. which was described from open forest at about 800 m altitude in the Newcastle Ranges near Georgetown in Queensland. A new combination under *Pecteilis* is required prior to a detailed molecular-based study of the Australian Orchidinae.

Pecteilis halata (D.L.Jones) D.L.Jones. ***comb. nov***. Basionym: *Habenaria halata* D.L.Jones, *Orchadian* 13(11): 518-519, fig.3 (2002).

3. *Habenaria anomala* Dockrill was simply overlooked in the above treatment (Jones & Clements 2018). The epithet '*anomala*' is already occupied in *Pecteilis* so a new epithet is required.

Pecteilis dockrillii D.L.Jones & M.A.Clem., ***nom. nov***. Basionym: *Habenaria anomala* Dockrill, *Orchadian* 12: 150 (1965).

4. In Clements & Jones (2018) we failed to cite the true basionym for *Pecteilis rumphii* and there is no full and direct reference to the intended basionym, as mandated by ICN Art. 41.5 so the name is invalid and a *nom. nud.* We here correct that situation.

Pecteilis rumphii (Brongn.) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Platanthera rumphii* Brongn. in L.I. Duperrey, *Voyage Autour du Monde. Botanique* 2: 194 (1834).

5. Christmas Island has numerous endemic species including several orchids: *Zeuxine exilis* Ridl., *Brachypeza archytas* (Ridl.) Garay and *Flickingeria nativitatis* (Ridley) J.J.Wood all described by Ridley from material collected on the island during an expedition in 1904 (Ridley 1904).

Corymborkis angusta, Christmas Island

Corymborkis angusta, Christmas Island

Amongst the other species Ridley collected and described was *Corymbis angusta* which until the present has been treated as a synonym of *Corymborkis veratrifolia*. Study of the type specimen and fresh collections and illustrations from Christmas Island confirms its uniqueness and it is here recognised and transferred to *Corymborkis*.

Corymborkis angusta (Ridl.) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Corymbis angusta* Ridl., J. Straits Branch Roy. As. Soc. 45: 234-235 (1906).

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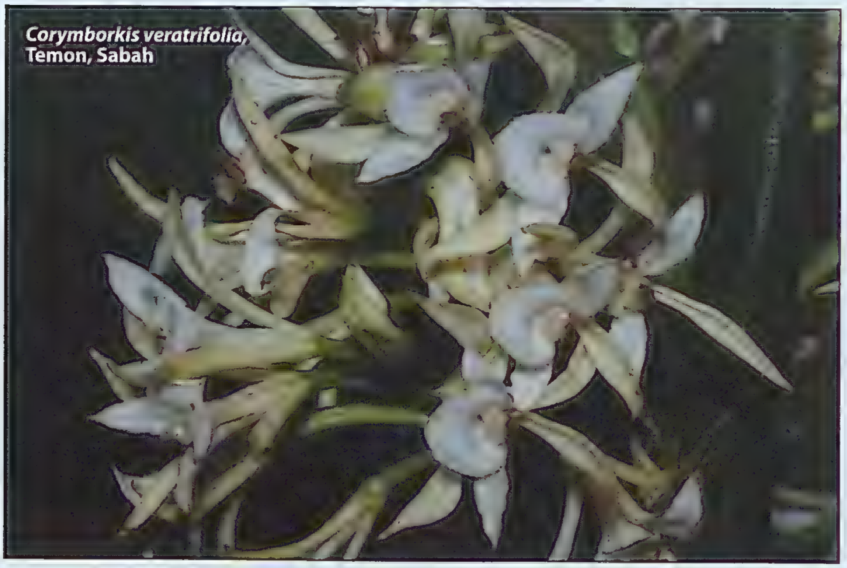

***Corymborkis veratrifolia*, Temon, Sabah**

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New species in the *Diplodium nanum* (R.Br.) D.L.Jones & M.A.Clem. complex (Orchidaceae) from Western Australia - 6

by David L. Jones and Christopher J. French

Abstract

Diplodium crispulum, Diplodium gracillimum, Diplodium scabrellum, Diplodium saxum, and *Diplodium setulosum* are described here as new. Notes are included on their recognition, distribution, ecology and conservation status. Distinguishing features of each species are compared with allied taxa.

Key Words

Orchidaceae, *Diplodium crispulum, Diplodium gracillimum, Diplodium saxum, Diplodium scabrellum, Diplodium setulosum, Diplodium nanum,* new species, Western Australia, Australian flora.

Introduction

Ongoing studies into the *Diplodium nanum* (R.Br.) D.L.Jones & M.A.Clem. complex in Western Australia have revealed several undescribed species. Some of these species are common, widespread and well conserved while others are known from only one or two locations and are possibly quite rare and may be under threat. It is extremely important that these taxa are formally recognised to allow appropriate conservation measures to be enacted. A recent DNA-based molecular phylogenetic study clearly showed that the genus *Linguella* aligns with *Diplodium* (Clements & Jones 2016) and the necessary nomenclatural transfers were made (Jones & Clements 2017).

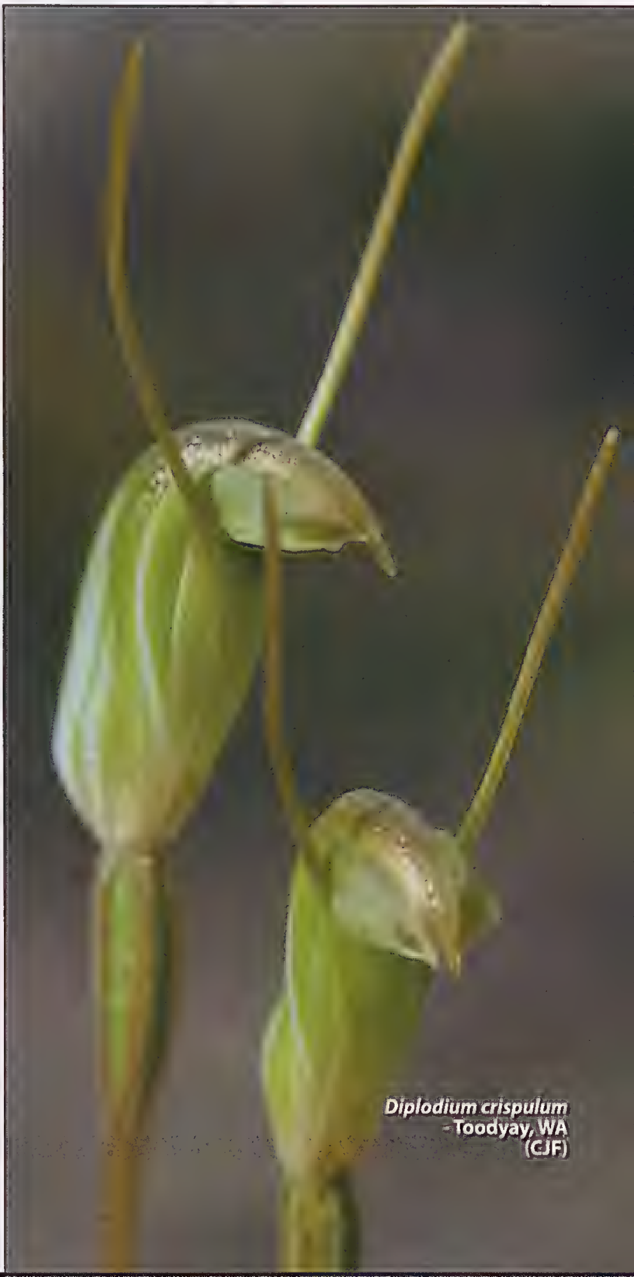
Five species are described as new in this, the sixth paper of the series. Sixteen new species in Western Australia have been previously described (Jones & French 1&2 (2014), 3 (2014), 4 (2015), 5 (2017)).

Materials and Methods

Descriptions of the new taxa were made from fresh specimens. Unless otherwise indicated, all types of *Diplodium* relevant to this study (or photographs thereof), and collections cited, have been seen by us.

TAXONOMY

1. ***Diplodium crispulum*** D.L.Jones & C.J.French, ***sp. nov.***; With affinity to *Diplodium nanum* (R.Br.) D.L.Jones & M.A.Clem. but differing by its rosette leaves with undulate/crispate margins (margins entire or slightly wavy for *D. nanum*), 3-6 spreading stem leaves (1 or 2 sheathing stem leaves for *D. nanum*) often also with crinkled margins and labellum with basal margins irregular or with a few short cilia (sparsely hairy in *D. nanum*).



Diplodium crispulum - Toodyay, WA (CJF)

TYPE: Western Australia. Darling District. Riverdale Road, opposite East Break, 2.95 km west of Old Coast Road, 5 Sep. 2004, *C.J.French 5820* (holo CANB 653961).

Illustration: Page 350, Hoffmann & Brown, second edition (1998) – as *Pterostylis aff. nana* – "Slender Snail Orchid". Page 412, Hoffmann & Brown, third edition (2011) – as *P.* sp. 'slender" - "Slender Snail Orchid". Page 358, Brown, Dixon, French & Brockman (2013) – as *P.* sp. "crinkled leaf" - "Slender snail orchid".

Description: *Rosette* basal; leaves 4-8 in a loose rosette; lamina ovate to sagittate, 6-14 mm long, 4-9 mm wide, bright green, paler beneath, margins strongly crinkled/crispate, subacute to acute; petioles 2-7 mm long, narrowly winged. *Scape* 15-25 cm long, slender, glabrous. *Stem leaves* spreading, 3-6, ovate to ovate-lanceolate, 8-15 mm long, 4-6 mm wide, margins entire or irregular. *Ovary* 4-6 mm long, dark green, glabrous. *Flower* solitary, 13-15 mm long, 5-6 mm across, translucent white with pale green stripes and markings, coalescent in the distal half. *Galea* gibbous at the base then erect, curving forwards in the distal third; apex shallowly decurved; dorsal sepal slightly longer than the petals. *Dorsal sepal* ovate-lanceolate, 14-18 mm long, 5-6 mm wide, inflated at the base then tapered, striped in the proximal half, coalescent in the distal half; apex subacute. *Lateral sepals* erect, tightly embracing the galea; sinus nearly flat to gently curved in side view; flat and centrally notched in front view, flanked by an area of darker green tissue; central lobe folded internally, c. 0.5 mm long, dark green; conjoined part 7-9 mm long, 5-6 mm wide, narrowed to c. 2.5 mm across at the base, the upper margins tapered suddenly into the free points; free points erect, linear, thin, 20-25 mm long, smooth. *Petals* obliquely oblong, 13-16 mm long, 4-4.5 mm wide, strongly falcate, narrowed sharply at the apex, green with a narrow white central stripe, distal third darker; anterior margin not flared, smooth or weakly crinkled; flange narrowly deltate, c. 2 mm across, obtuse. *Labellum* erect, curved forwards near the apex, white with green stripes in the proximal half, red to brownish in the distal half. *Labellum lamina* oblong-elliptic, c. 5 mm long, 2 mm wide; lateral margins glabrous, basal margins irregular or with a few short cilia; apex obtuse. *Callus* c. 0.4 mm across, ridged, expanding to c. 0.7 mm across near the apex; basal appendage deflexed, oblong-tapered, c. 2 mm long, apex multilobed, sparsely ciliate, curved upwards. *Column* 8-9 mm long, angled away from the ovary at about 45° at the base then obliquely erect, green. *Column wings* c. 2.5 mm long; basal lobe c. 0.8 mm long, at an angle of c. 70°; anterior margin curved, obtuse; inner margin and apex adorned with short white cilia; mid-section c. 1.2 mm long, green; apical lobe oblong, c. 1 mm long. *Anther* c. 1 mm long, obtuse. *Pollinia* linear, c. 1 mm long, falcate, mealy, yellow. *Stigma* central, elliptical, c. 3.5 mm long, c. 1 mm wide, raised. *Capsule* not seen. **Fig. 1.**

Distribution and ecology: Endemic in south-western WA where common from Perth to Albany extending inland in areas of higher rainfall forests and woodlands, with a disjunct population at Banks Rock east of Hyden. Grows in a wide range of habitats, including among leaf litter on lateritic breakaways, white gum woodland, sheoak forest, on margins of granite rocks, coastal shrubland over limestone, coastal forests among peppermint, tuart, marri and jarrah; also in tall karri forest. Soils range from sand, shallow soil over limestone, lateritic loam and heavy brown loam. Flowering July to early October.

Recognition: Characterised by basal leaves in a distinct rosette, the margins usually crisped or crinkled, several stem-clasping cauline leaves often also with crinkled margins, thin glabrous scape and relatively small flowers with filiform free points.

Similar species: Morphologically similar to *Diplodium karri* but shorter growing and with smaller rosette leaves with crispate/crinkled margins, smaller, narrower flowers with shorter free points and shorter tip on the dorsal sepal. This species may be part of a complex of similar looking taxa, but with smooth leaf margins, that occur within its range. It has been confused with two sympatric undescribed taxa, one with larger, fatter flowers with longer lateral sepal free points and larger, more numerous basal rosette leaves, and the other, much taller, larger flowered with longer lateral sepal free points, a loose rosette with larger leaves and a similar appearance to *Diplodium karri*. *Diplodium crispulum* can be found growing with *D. ectyphum* which has more numerous, dark green fleshy rosette leaves with entire margins and has shorter, thicker sepals; also with *D. angulatum* which has larger, paler green and white flowers with broad petals and clubbed verrucose lateral sepals.

Notes: This new species is listed on Florabase (https://florabase.dpaw.wa.gov.au) as *Pterostylis* sp. crinkled leaf (G.J. Keighery 13426).

Conservation status: Widespread and well conserved.

Etymology: The Latin *crispulus*, finely and irregularly crinkled, referring to the margins of the leaves.

Other specimens: WESTERN AUSTRALIA, Darling District: Summit of Mount Cooke, Darling Scarp, 22 Jul. 1997, *G.Brockman (GBB 164)* (PERTH 05763215); 400 m W of Yarra Road and 0.5 km N of Ball Road, Mundaring District, 5 Aug. 1997, *G.Brockman (GBB 192)* (PERTH 05759935); 400 m N on Terwonga Road from Priestville Road junction, Williams, 15 Aug. 1997, *G.Brockman (GBB 216)* (PERTH 05760038); Watershed Road, 11.6 km S of Brookton Highway, 7 Aug. 2003, *G.Brockman (GBB 856)* (PERTH 06732771); Canning Mills Road, Martin, 100 m S of Mills Road East junction, 2 Aug. 2006, *G.Brockman (GBB 1734)* (PERTH 07511965); McAlinden Road, 2.3 km E of Donnybrook - Boyup Brook Road, sandy track to W, 1 Oct. 2006, *G.Brockman (GBB 1955)* (PERTH 07511345); Corner of Baldivis Road and Karnup Road, 22 Jul. 2003, *C.J.French (CJF 3656)* (CANB 648261); Mt Hassell, 24 Aug. 1997, *C.J.French (CJF 718)* (CANB 665506); Burnett Forest Block, approximately 2.1 km along Railway Parade, off North side, from Highway 1, 21 Sept. 1997, *W.Jackson (BJ 479)* (PERTH 05447488); Nine Mile Lake Nature Reserve, Herron Point Road, 29 Aug. 2013, *G.J. Keighery 17124* (Perth 08058229).

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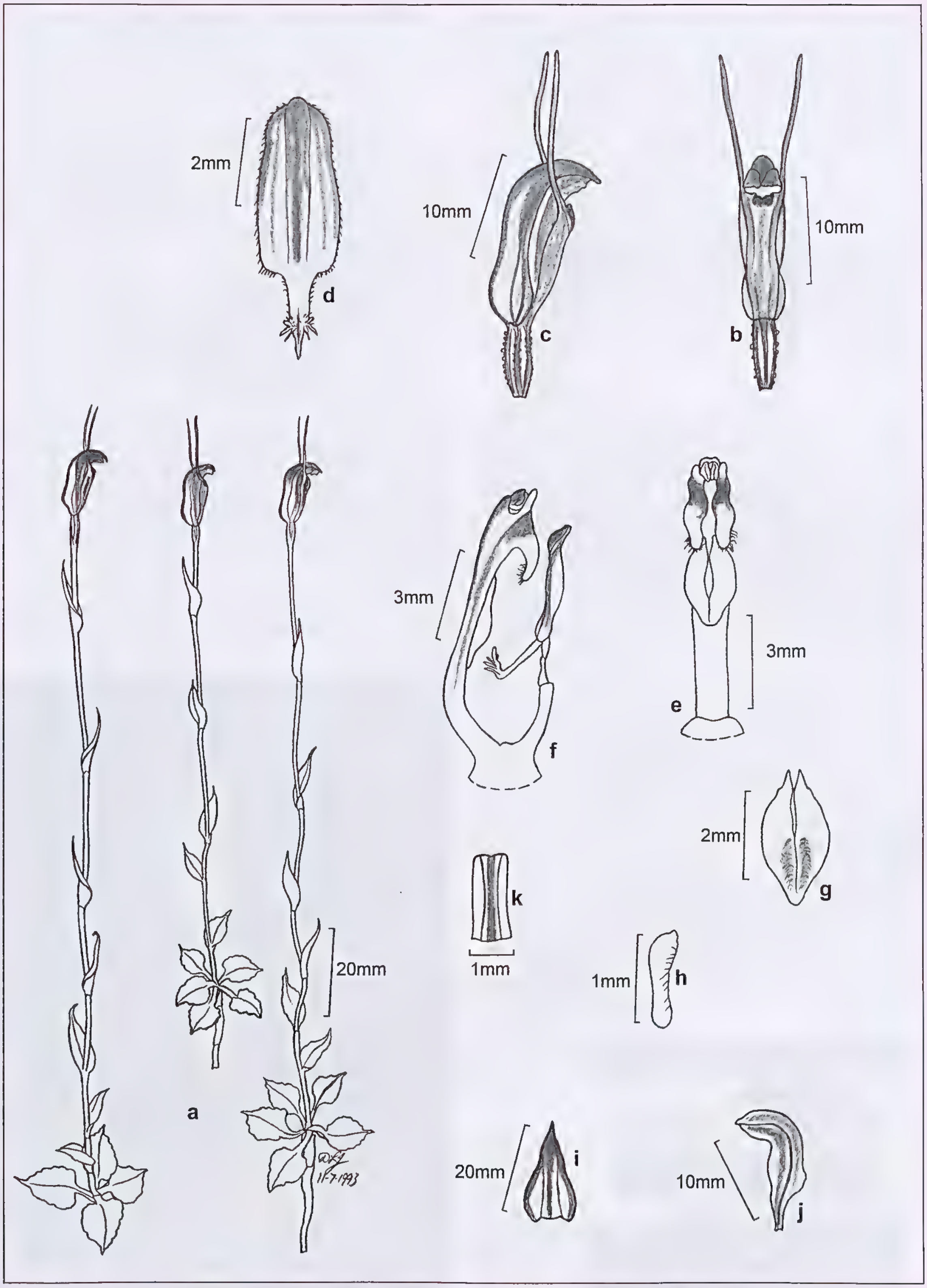

***Diplodium crispulum*, Mt Cook, Albany Highway, C.French.** **(Fig. 1.)**
a. flowering plants; b. flower from front; c. flower from side; d. labellum; e. column from front; f. column and labellum from side; g. stigma; h. pollinium; i. dorsal sepal; j. petal; k. labellum hinge.
© D.L.Jones, drawn 11 July 1993.

2. ***Diplodium gracillimum*** D.L.Jones & C.J.French, ***sp. nov***. With affinity to *Diplodium nanum* (R.Br.) D.L.Jones & M.A.Clem. but differing by its taller habit (70-250 mm *cf.* 50-150 mm for *D. nanum*) with up to 10 (4-8 for *D. nanum*) narrower rosette leaves (3-6 mm wide *cf.* 4-8 mm for *D. nanum*) drawn out in long fine points, narrower attenuate ovaries, narrower flowers, much longer free points (16-20 mm long *cf.* 10-15 mm for *D. nanum*) on the lateral sepals and smaller labellum with glabrous margins (sparsely hairy in *D. nanum*).

TYPE: Western Australia. Darling District. Moores Track (Fish Creek Track), 2.9 km from Chesapeake Road, 29 Sep. 2000, *C.J.French 2613* (holo CANB 624667).

Illustrations: Page 363, Brown, Dixon, French & Brockman (2013) – as *P.* sp. "long sepals" – "long sepaled snail orchid".

Description: *Rosette* basal; leaves 5-10; lamina sagittate to elliptical, 5-15 mm long, 3-6 mm wide, pale green, paler beneath, margins entire, apex acuminate to long-acuminate; petioles 0-10 mm long, thin. *Scape* 7-25 cm long, thin, glabrous. *Stem leaves* spreading, 3-4, narrowly ovate-lanceolate, 5-10 mm long, 3-4 mm wide, tips acuminate. *Ovary* 7-10 mm long, often attenuate, dark green, glabrous. *Flower* solitary, 12-15 mm long, 4-5 mm wide, translucent white with bright green to brownish stripes and markings, coalescent in the distal half. *Galea* gibbous at the base then erect, curving forwards in the distal third; apex flat or slightly decurved; dorsal sepal slightly longer than the petals. *Dorsal sepal* ovate-lanceolate, 16-20 mm long, 7-9 mm wide, inflated at the base then tapered, striped, colours coalescent near the apex; apex drawn out into a fine point. *Lateral sepals* erect, tightly embracing the galea; sinus nearly flat or shallowly curved in side view; upper margins nearly flat with a shallow central notch in front view, flanked by an area of darker green tissue; central lobe folded internally, oblong, c. 1 mm long, obtuse, dark green; conjoined part 9-10 mm long, 5-6 mm wide, narrowed to c. 2.5 mm across at the base, the upper margins tapered suddenly into the free points; free points erect above the galea, narrowly linear, 16-20 mm long, smooth. *Petals* obliquely oblong, 13-15 mm long, 3.5-4 mm wide, falcate, dilated near the apex, green to light brown with a narrow white central stripe, distal third darker; anterior margin flared, weakly undulate, apex narrowly pointed; flange deltate, c. 2 mm long, obtuse. *Labellum* erect, curved forwards near the apex, white with green stripes in the proximal half, green in the distal half. *Labellum lamina* elliptic, c. 4.5 mm long, 2 mm wide; lateral margins glabrous, basal margins with a few short white cilia. *Callus* c. 0.5 mm across, ridged, expanding to c. 0.7 mm across near the apex; basal appendage deflexed, linear-tapered, c. 2.5 mm long, sparsely ciliate, curved up at the apex, trilobed. *Column* 9-11 mm long, angled away from the ovary at about 50° at the base then obliquely erect, light green. *Column wings* c. 3.5 mm long; basal lobe c. 1 mm long, at an angle of c. 70°; anterior margin curved, obtuse; inner margin and apex adorned with short white cilia; mid-section c. 1.8 mm long, green; apical lobe linear, c. 1 mm long. *Anther* c. 1 mm long, obtuse. *Pollinia* linear, c. 1.3 mm long, falcate, mealy, yellow. *Stigma* central, elliptical, c. 3 mm long, c. 1 mm wide, raised. *Capsule* not seen. **Fig. 2.**

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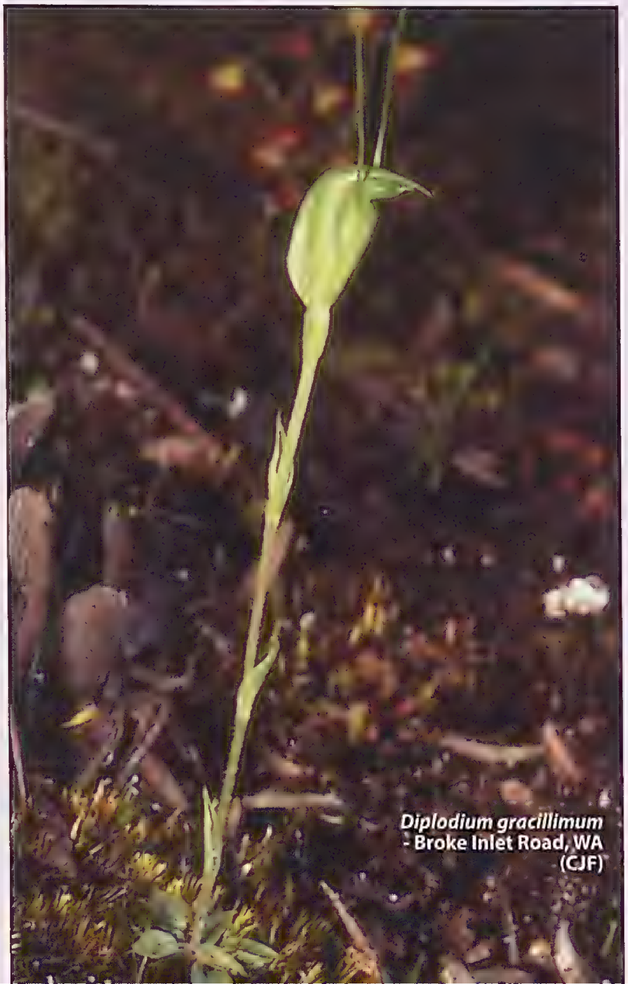
Distribution and ecology: Endemic in south-western WA in a coastal strip between Denmark and Windy Harbour, growing in high rainfall forest. Confined to shallow soil pockets on granite rocks. Flowers late August to early October.

Recognition: A thin-stemmed snail orchid growing to 250 mm tall with a distinctive compact rosette of tightly packed, small, sharply pointed green leaves and small, narrow, green to light brown flowers with long thin free points extending high above the galea. The ovary is particularly long and narrow, often appearing attenuate and merging into the pedicel.

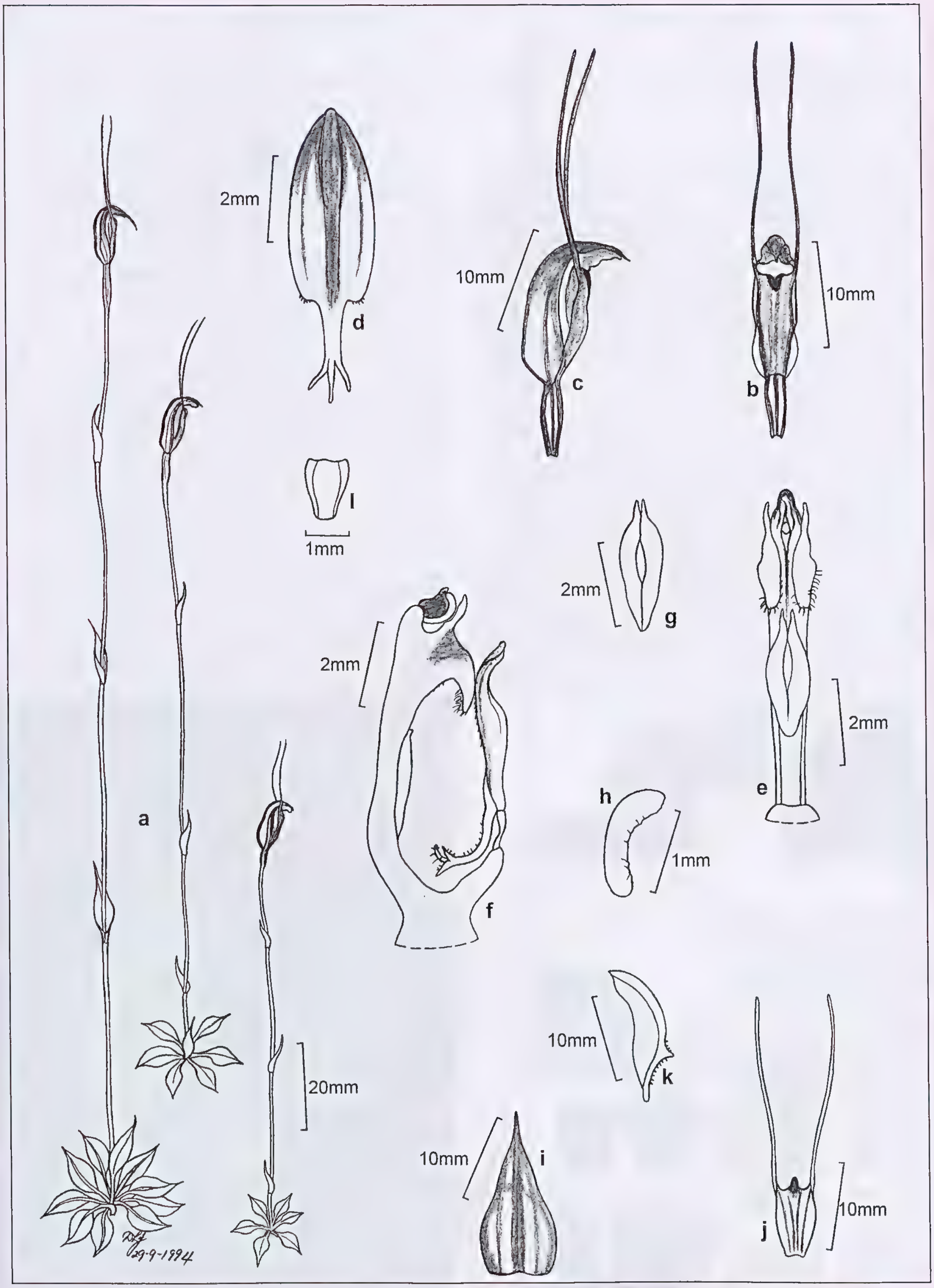
Similar species: *Diplodium microphyllum* has a similar compact rosette of small leaves but has larger, fatter flowers (14-16 mm long, c. 4.5mm across *cf.* 12-15 mm long, 4-5 mm wide for *D. gracillimum*), shorter lateral sepal free points (14-16 mm long *cf.* 16-20 mm long for *D. gracillimum*) and grows in swampy habitats.

Sympatric species: The new species is sympatric with *Diplodium jacksoni*, *D. crispulum* and *D. karri* but is readily distinguished from all these species by its compact rosette of small pointed leaves and very slender features. It sometimes grows with *Diplodium erubescens* but that species flowers earlier and is much more robust with hairy stem, numerous cauline leaves and much larger reddish flowers.

Notes: This new species is listed on Florabase (https://florabase.dpaw.wa.gov.au) as *Pterostylis* sp. granite (W. Jackson BJ351).



***Diplodium gracillimum* - Broke Inlet Road, WA (CJF)**



***Diplodium gracillimum*, Chesapeake Rd, from Broke Inlet Rd, WA, Bill Jackson *(DLJ13428)*.** (Fig. 2.)
a. flowering plants; b. flower from front; c. flower from side; d. labellum; e. column from front; f. column and labellum from side; g. stigma; h. pollinium; i. dorsal sepal; j. synsepalum; k. petal; l. labellum hinge.
© D.L.Jones, drawn 29 Sep. 1994.

Conservation Status: Reasonably common and conserved.

Etymology: From the Latin *gracilis*, slender and *–illimus*, very (superlative), referring to the thin, slender habit of the whole plant.

Other specimens: WESTERN AUSTRALIA, Darling District: Granite outcrop opposite Tindale Road/South Coast Highway, E of Walpole, 1 Oct. 1997, *G.Brockman (GBB 350)* (PERTH 04933877); Ficifolia Road, 1 km from Nutt Road, 2 Oct. 2004, *C.J.French (CJF 5958)* (CANB 656632); Hwy 1 opp Tindale Road, 2 Oct. 2004, *C.J.French (CJF 5970)* (CANB 656635); W side of Stan Road, c. 1 km N from Sandy Track Road, 16 Jul. 1997, *B.G. Hammersley 1714* (PERTH 04921623); Broke Inlet Road, c. 600 m from South Coast Highway, 150 m on NW side of road, 20 Sept. 1994, *W.Jackson (BJ 297)* (PERTH 04261763); c. 600 m along Broke Inlet road from South Coast Highway, N side. Rock about 150 m off road, 11 Sept. 1995, *W.Jackson (BJ 344)* (PERTH 04278674); Off Chesapeake road, N side, c. 8.8 km from Broke Inlet road, 15 Sept. 1995, *W.Jackson (BJ351)* (PERTH 04278712); E side of South Coast Highway, c. 19.5 km NW of Walpole, 28 Sept. 1995, *W.Jackson (BJ 343)* (PERTH 04278666); c. 16 km NW of Walpole, Rock E side off South Coast Highway, c. 100 m Keystone State Forest, 28 Sept. 1995, *W.Jackson (BJ 342)* (PERTH 04278453); Approximately 300 m off South side of Mt Pingerup Track, D'Entrecasteaux National Park, 6 Sept. 1997, *W.Jackson (BJ 478)* (PERTH 05447496).

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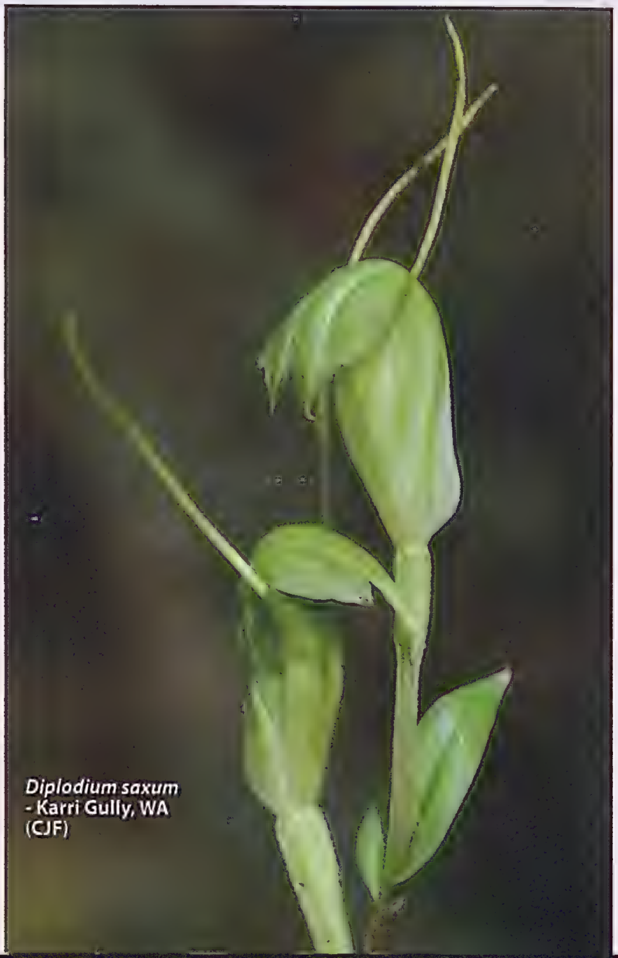
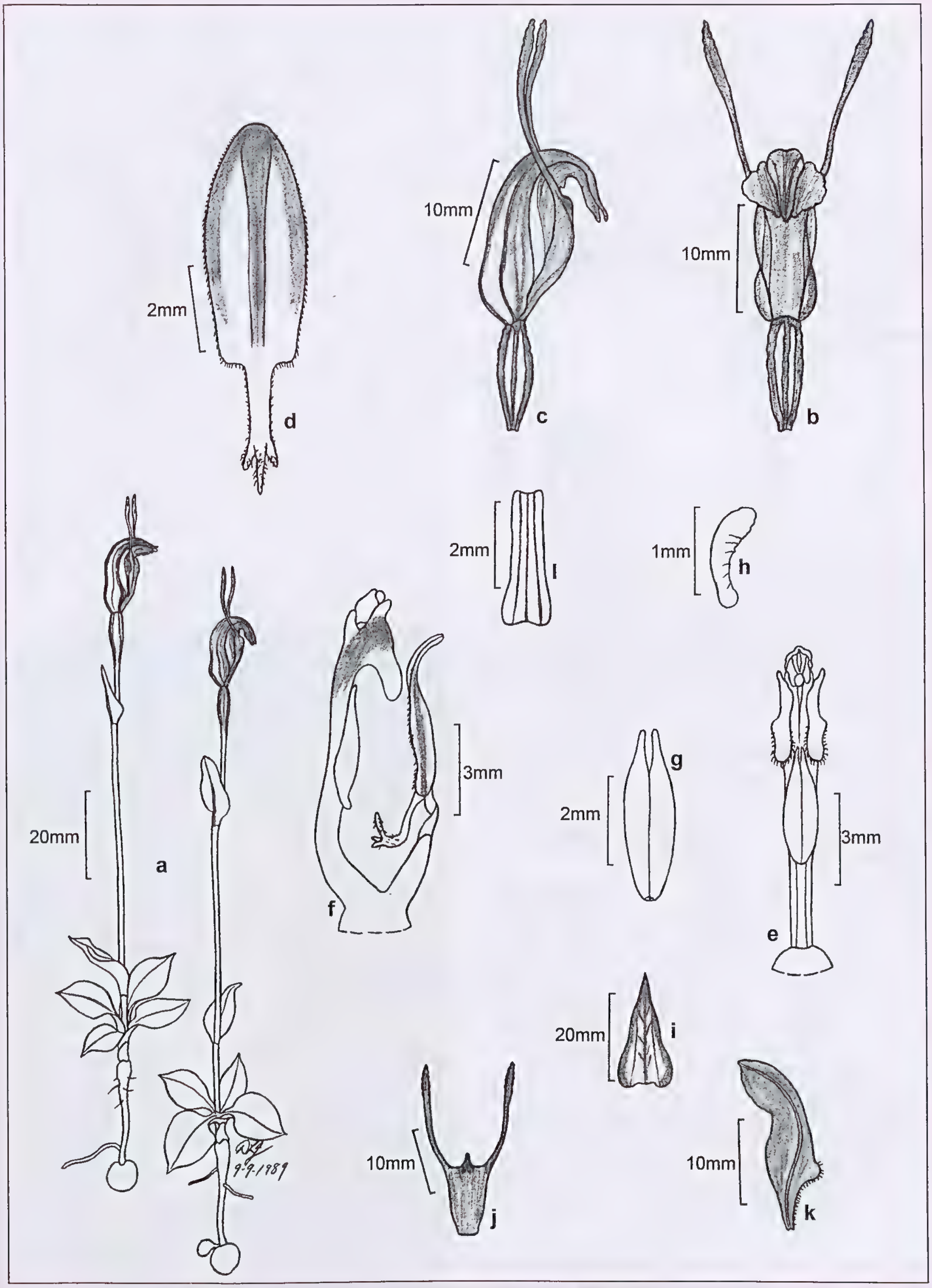
3. *Diplodium saxum* D.L.Jones & C.J.French ***sp. nov.*** With affinity to *Diplodium nanum* (R.Br.) D.L.Jones & M.A.Clem. but differing by larger rosette leaves (8-15 mm long x 5-10 mm wide *cf.* 4-15 mm long x 4-8 mm wide for *D. nanum*), thicker glabrous scape, larger plump flower (17-19 mm long x 7-9 mm across *cf.* 10-15 mm long x 4-5 mm wide for *D. nanum*) with broad petals, decurved galea apex, irregularly clavate free points (filiform for *D. nanum*) and an oblong-elliptic labellum with scabrid margins (ovate to oblong with sparsely hairy margins in *D. nanum*).

TYPE: Western Australia. Darling District, Castle Rock, Porongurup National Park, 20 Oct. 1988, *D.L.Jones 3281* (holo CBG 8806943).

Description: *Rosette* basal; leaves 4-6; lamina ovate, 8-15 mm long, 5-10 mm wide, dark green, paler beneath, margins entire, apex subacute to acute; petioles 0-6 mm long, narrowly winged. *Scape* 8-15 cm long, glabrous. *Stem leaves* spreading, 2-3, ovate-lanceolate, 8-15 mm long, 4-7 mm wide, apex subobtuse. *Ovary* 7-9 mm long, pale green, verrucose. *Flower* solitary, 17-19 mm long, 7-9 mm across, translucent white with dark green stripes and markings, coalescent in the distal half. *Galea* gibbous at the base then erect, curving forwards in the distal third; apex shallowly to strongly decurved; dorsal sepal as long as the petals. *Dorsal sepal* ovate-lanceolate, 22-26 mm long, 10-12 mm wide, inflated at the base then tapered, striped in the proximal half, coalescent in the distal half; apex acute. *Lateral sepals* erect, tightly embracing the galea; sinus curved in side view; upper margins flat or sloping gently to a shallow central notch in front view, flanked by an area of darker green tissue; central lobe folded internally, oblong, c.1 mm long, obtuse; conjoined part 8-11 mm long, 5-6 mm wide, narrowed to c. 2.5 mm across at the base, the upper margins tapered suddenly into the free points; free points erect above the galea, narrowly clavate, verrucose,



Diplodium saxum - Karri Gully, WA (CJF)



Diplodium saxum, Castle Rock. Porongorup N.P., WA., D.L.Jones. (Fig. 3.)
a. flowering plants; b. flower from front; c. flower from side; d. labellum; e. column from front; f. column and labellum from side; g. stigma; h. pollinium; i. dorsal sepal; j. synsepalum,; k. petal; l. labellum hinge.
© D.L.Jones, drawn 9 Sep 1989.

14-18 mm long, straight or curved. *Petals* obliquely oblong, 18-22 mm long, 5-6 mm wide, falcate, narrowed towards the apex, green with a narrow white central stripe, distal third darker; anterior margin widely flared, undulate; flange obtuse, hairy. *Labellum* erect, curved forwards suddenly near the apex, white with green stripes in the proximal half, green in the distal half. *Labellum lamina* oblong-elliptic, c. 6 mm long, 2.5 mm wide; lateral and basal margins shortly ciliate; apex obtuse. *Callus* c. 0.4 mm across, ridged, expanding to c. 0.7 mm across near the apex; basal appendage deflexed, linear, c. 3 mm long, trilobed, ciliate, curved up at the apex. *Column* 8-11 mm long, angled away from the ovary at about 45° at the base then obliquely erect, light green. *Column wings* c. 3.5 mm long; basal lobe c. 1.3 mm long, at an angle of c. 70°; anterior margin curved, obtuse; inner margin and apex adorned with short white cilia; mid-section c. 1.8 mm long, green; apical lobe oblong, c. 0.8 mm long. *Anther* c. 1 mm long, obtuse. *Pollinia* linear, c. 1.2 mm long, falcate, mealy, yellow. *Stigma* central, narrowly elliptical, c. 4 mm long, c. 1.2 mm wide, raised. *Capsule* not seen. **Fig. 3.**

Distribution and ecology: Endemic in south-western WA. Occurs in the Stirling and Porongorup Ranges, extending west to Northcliffe. Grows under shrubs in tall forest and among boulders in stony brown loam. Flowers August and September.

Recognition: Characterised by leaves in a basal rosette, glabrous scape, plump flower with broad petals, decurved galea apex, irregularly clavate free points and an oblong-elliptic labellum with scabrid margins.

Similar species: Possibly confused with *Diplodium crispulum* which has numerous rosette leaves with crinkled/crispate margins, long narrow sepals and a smaller flower with the galea tip porrect, not decurved.

Notes: *Diplodium saxum* is sympatric with *D. karri* but has shorter plants with a well-defined rosette and plump flowers with decurved galea apex and irregularly clavate free points.

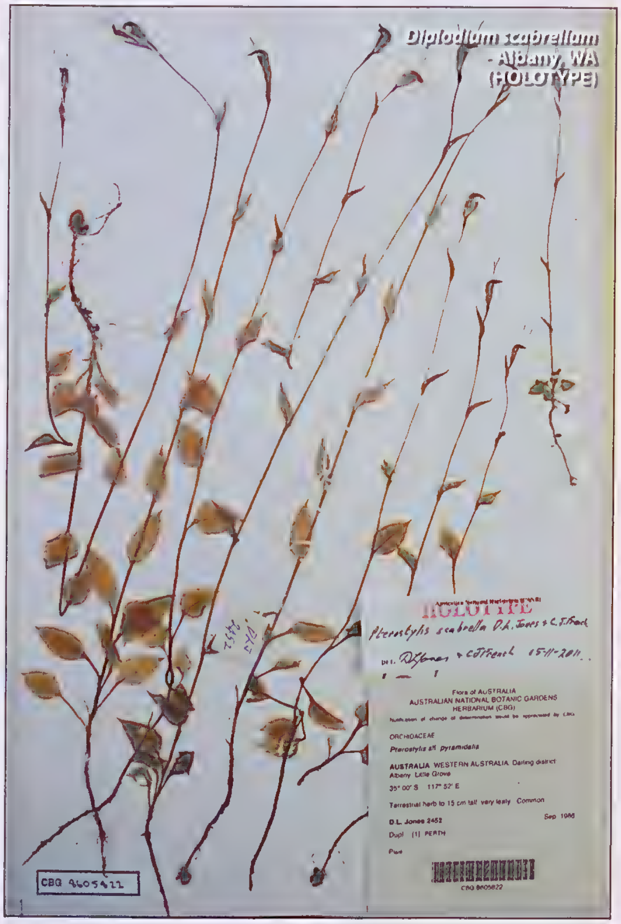
Conservation Status: Poorly known but relatively widespread and conserved in National Parks.

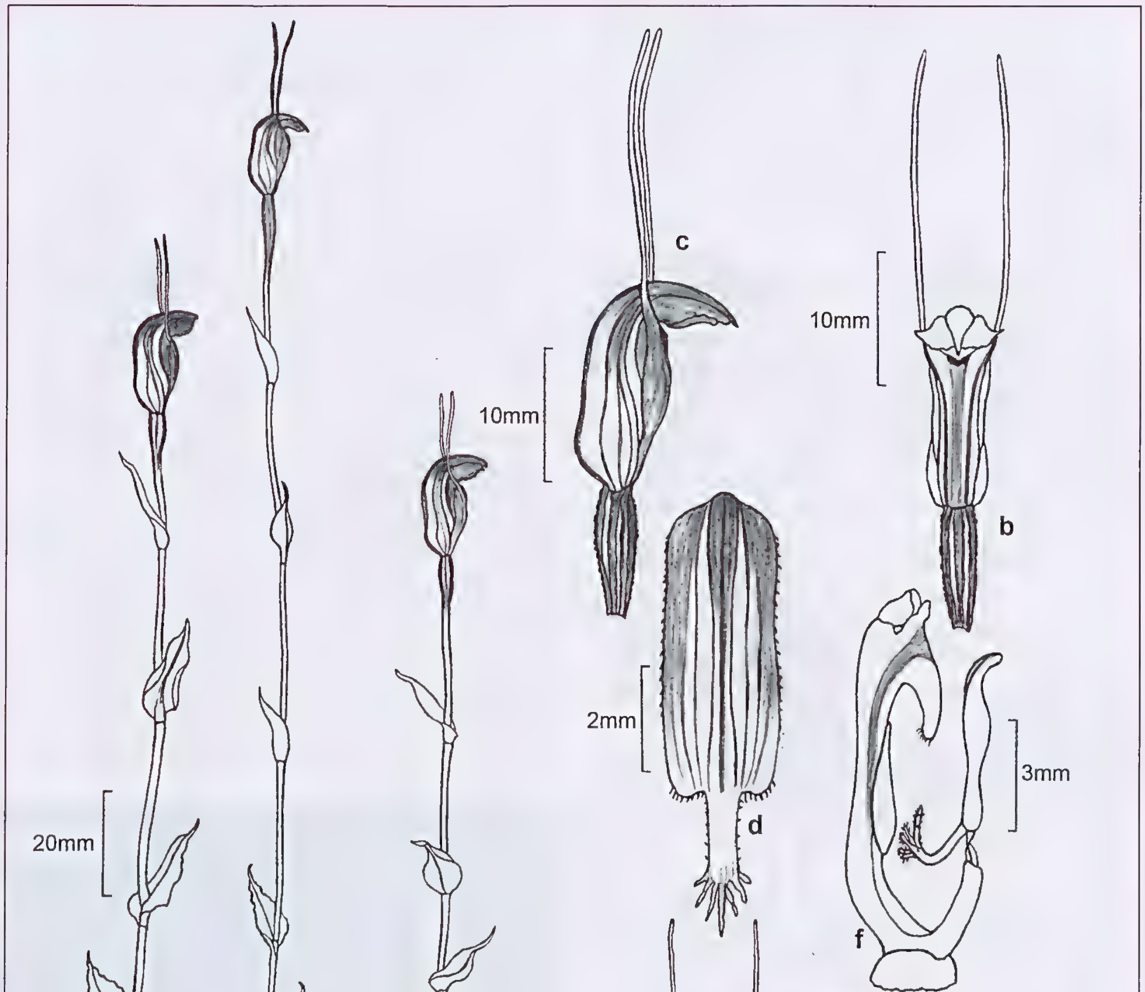
Etymology: The Latin *saxum*, rock, this species grows among large granite boulders at the type locality in the Porongorup Ranges.

4. *Diplodium scabrellum* D.L.Jones & C.J.French, ***sp. nov.*** With affinity to *Diplodium pyramidalis* (Lindl.) D.L.Jones & M.A.Clem. but differing by its distinctly petiolate leaves with crinkled/crispate margins (leaves stalkless for *D. pyramidalis*), smaller and narrower flowers (14-16 mm long *cf.* 16-20 mm long for *D. pyramidalis*), and shortly pointed dorsal sepal and an oblong labellum with shortly scabrous margins; also with *D. karri* (D.L.Jones & C.J.French) D.L.Jones & M.A.Clem. differing by its generally shorter stature, evenly distributed stem leaves, smaller flowers and oblong labellum with scabrous margins (elliptical labellum with entire margins in *D. karri*).

TYPE: Western Australia. Darling District. Albany, Little Grove, Sep. 1986, *D.L.Jones 2452* (holo CBG 8605822, iso PERTH). (Photograph of Holotype reproduced in this paper.)

Description: *Rosette* basal or all leaves cauline; leaves either 3-5 in a loose rosette or all leaves spirally arranged up the stem; lamina ovate to elliptical or cordate, 12-25 mm long, 6-15 mm wide, bright green, paler beneath, margins entire or crinkled/crispate, apex subacute to acute; petioles 0-8 mm long. *Scape* 120-200 mm long, thin, glabrous. *Ovary* 7-8 mm long, elliptical, green, siliceous, verrucose. *Flower* solitary, 14-16 mm long, 6-7 mm wide, erect, translucent white striped with green in proximal half, suffused with red-brown in distal third; galea gibbous at base, then erect, bending forwards suddenly in distal third, apex horizontal or slightly decurved, dorsal sepal equal to or longer than petals. *Dorsal sepal* 22-25 mm x 8-10 mm, slightly inflated at the base then tapered to the apex, translucent white at base, broad green margins stripes, distal third reddish-brown, apex long acuminate. *Lateral sepals* erect, tightly embracing the galea; sinus shallowly curved in side view, sloping gently to a shallow central notch in front view, flanked by an area of dark green tissue; central lobe c. 1 mm long, dark green, obtuse, folded internally; conjoined part 8-10 mm x 5.5-6 mm, narrowed to c. 2 mm at the base, the upper margins tapered suddenly to the free points; free points held high above the galea, 15-24 mm long, linear, greenish-yellow, lower margins inrolled. *Petals* obliquely lanceolate, 14-17 mm x 3-5 mm, strongly falcate, broadly dilated near the apex, the anterior margins undulate to irregular, obtuse, green with a narrow white central patch, distal third reddish-brown; flange c. 2 mm across, sharply deltoid, transparent, the lower margins with short cilia. *Labellum* erect, curved suddenly near the apex, white becoming pinkish or reddish in the distal half. *Labellum lamina* oblong, 5.5-6 mm long, c. 2.3 mm wide, slightly narrowed above the middle, lateral and basal margins shortly ciliate, apex broadly obtuse, ventral surface with appressed short scabrid whitish teeth. *Callus* c. 0.3 mm across, slightly raised, expanded to c. 0.5 mm across, near the apex; basal appendage linear, c. 2.5 mm long, deflexed, trilobed, turned up near the apex, margins sparsely ciliate. *Column* 8-9 mm long, angled away from the ovary at about 50° at the base then erect, light green. *Column wings* c. 3 mm long; basal lobe c. 1.3 mm, at an angle of about 60°, anterior margin curved, obtuse, inner margin and apex adorned with short white cilia; mid-section c. 1.3 mm long, green; apical lobe ca 0.6 mm long, linear, obtuse. *Anther* c. 1 mm long, obtuse or shortly rostrate. *Pollinia* c. 1 mm long, linear, yellow, mealy. *Stigma* situated just below the column wings, elliptical, c. 5 mm long, c. 2 mm wide, raised. *Capsule* not seen. **Fig. 4.**


Diplodium scabrellum
- Albany, WA
(HOLOTYPE)
HOLOTYPE
Pterostylis scabrella D.L.Jones & C.J.French
D.L.Jones & C.J.French 15-11-2011
Flora of AUSTRALIA
AUSTRALIAN NATIONAL BOTANIC GARDENS
HERBARIUM (CBG)
ORCHIDACEAE
Pterostylis aff. pyramidalis
AUSTRALIA WESTERN AUSTRALIA Darling district
Albany Little Grove
35° 00' S 117° 52' E
Terrestrial herb to 15 cm tall very leafy Common
D.L. Jones 2452
Sep 1986
Dupl (1) PERTH
CBG 8605822



***Diplodium scabrellum*, Margaret River area, WA, G.Wright.** **(Fig. 4.)**
a. flowering plants: b. flower from front; c. flower from side; d. labellum; e. column from front; f. column and labellum from side; g. stigma; h. pollinium; i. dorsal sepal; j. lateral sepals; k. petal.
© D.L.Jones, drawn Aug. 1987.

Distribution and ecology: Endemic in south-western WA in a coastal strip between Augusta and Albany, growing in eucalypt forest in sand, and sand over laterite, sometimes near granite. Flowering August to mid-September.

Recognition: Tall plants with a loose basal rosette of petiolate leaves with crinkled/crispate margins, several stem leaves, small, narrow flowers with broad petals, long fine sepals and a pinkish oblong labellum with scabrous margins.

Similar species: The new species is similar to *Diplodium pyramidalis* which grows taller, lacks a distinct basal rosette, the basal leaves mostly sessile or with vestigial petioles and with smooth margins, has larger and broader flowers and with a glabrous labellum. It also grows in swampy habitats whereas *D. scabrellum* grows in freely draining soils. It has similarities with *Diplodium karri* but has evenly distributed stem leaves whereas *D. karri* has numerous large leaves in a loose basal group, the stem leaves becoming progressively shorter up the stem giving an almost conical look to the plant; also the elliptical labellum of *D. karri* is glabrous.

Conservation status: This species, which may be locally common, consists of widely separated populations, several of which are conserved.

Etymology: The Latin *scabrellus*, rough, scabrid, referring to the labellum surface and margins.

Other specimens: WESTERN AUSTRALIA, Darling District: Private property 13 km NE of Augusta, 5 Aug. 1995, *R.P.Hart* 4900 (PERTH 04275241); Gull Rock Road, at start of Reserve, E of Albany, 2 Aug. 1978, *M. Sherwood 42* (PERTH 04514793).

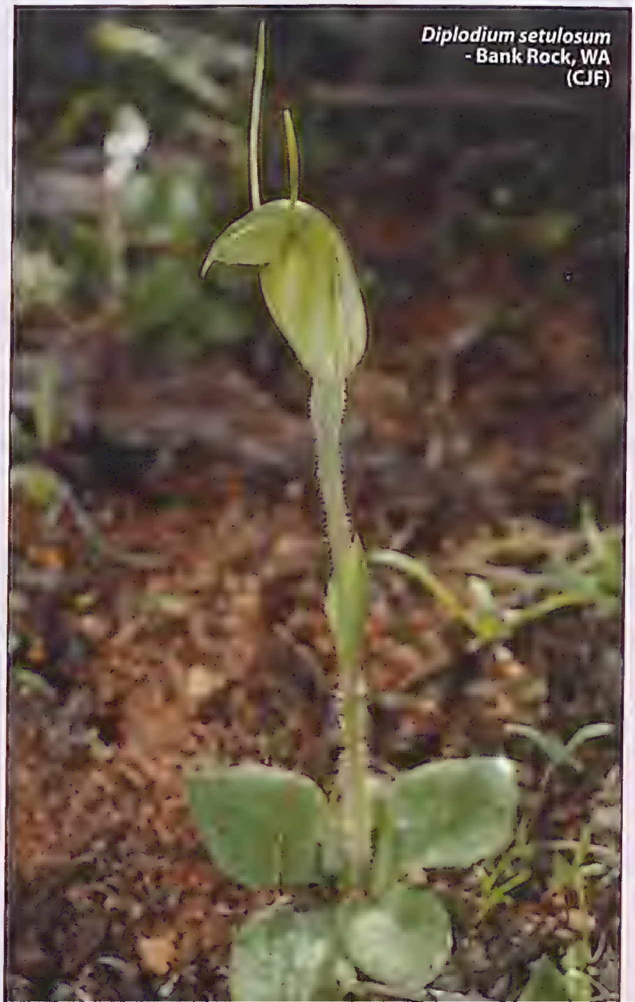
5. *Diplodium setulosum* D.L.Jones & C.J.French, ***sp. nov.*** With affinity to *Diplodium nanum* (R.Br.) D.L.Jones & M.A.Clem. but differing by its larger rosette leaves (12-22 mm long x 6-13 mm wide *cf.* 4-15 mm long x 4-8 mm wide for *D. nanum*), thicker densely hairy scapes (smooth or slightly roughened for *D. nanum*), larger spreading cauline leaves, hairy ovaries , larger flowers (14-18 mm long x 5-8 mm across *cf.* 10-15 mm long x 4-5 mm wide for *D. nanum*) with longer sepaline free points (12-24 mm long cf. 10-15 mm for *D. nanum*) and a glabrous labellum (sparsely hairy in *D. nanum*).

TYPE: Western Australia. Coolgardie District. Queen Victoria Rock [Victoria Rock] Nature Reserve, 31 Aug. 1999, *K.J.Fitzgerald 168, A.Brown, G.Brockman, N.Evans, C.J.French, G.M.Bussell & J.Brown* (holo CANB 601454).

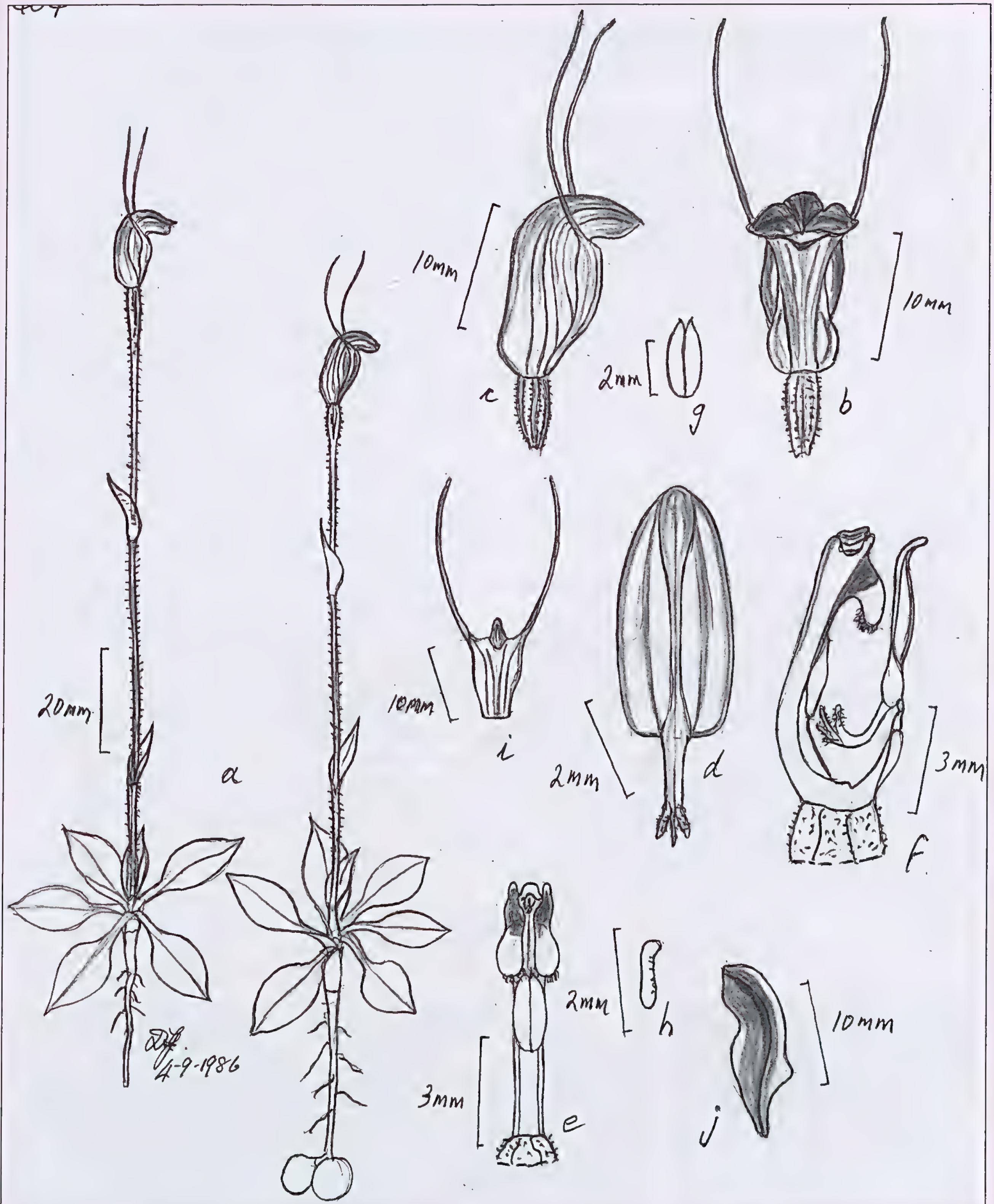
Illustration: Page 349, Hoffmann & Brown, second edition (1998) – as *Pterostylis aff. nana* – "Hairy-stemmed Snail Orchid". Page 411, Hoffmann & Brown, third edition (2011) – as *P.* sp. 'hairy" - "Hairy-stemmed Snail Orchid". Page 361, Brown, Dixon, French & Brockman (2013) – as *P.* sp. "inland" - "Hairy-stemmed Snail Orchid".

Description: *Rosette* basal; leaves 5-7 in a tight rosette; lamina ovate, 12-22(-30) mm long, 6-13 mm wide, bright green, paler beneath, fleshy, margins entire, apex acute to acuminate; petioles 2-12 mm long. *Scape* 5-15(-25) cm long, hairy. *Stem leaves* spreading, 1-4, ovate-lanceolate, 8-16 mm long, 4-6 mm wide. *Ovary* 4-7 mm long, dark green, hairy. *Flower* solitary, 14-18 mm long, 5-8 mm across, translucent white with dark green stripes and markings, coalescent in the distal half. *Galea* gibbous at the base then erect, curving forwards in the distal third; apex straight or decurved; dorsal sepal as long as or longer than the petals. *Dorsal sepal* ovate-lanceolate, 17-25 mm long, 7-12 mm wide, inflated at the base then tapered, striped in the proximal half, coalescent in the distal half; apex acute to acuminate. *Lateral sepals* erect, tightly embracing the galea; sinus shallowly to strongly curved in side view; upper margins gently curved inwards to a shallow central notch in front view, flanked by an area of darker green tissue; central lobe folded internally, c. 1.3 mm long, dark green; conjoined part 7-12 mm long, 4.5-5.5 mm wide, narrowed to c. 2.5 mm across at the base, the upper margins tapered suddenly into the free points; free points erect, narrowly linear, 12-242 mm long, smooth, held high above the galea. *Petals* obliquely oblong, 12-20 mm long, 4-5 mm wide, strongly falcate, broadly dilated near the apex, green with a narrow white central stripe, distal third darker; anterior margin widely flared, smooth; flange deltate, c. 1.5 mm long, obtuse. *Labellum* erect, curved forwards near the apex, white with green stripes in the proximal half, green in the distal half. *Labellum lamina* oblong to ovate-oblong, c. 5 mm long, 2.3 mm wide; lateral and basal margins glabrous or sparsely scabrous; apex obtuse. *Callus* c. 0.4 mm across, ridged, expanding to c. 0.7 mm across near the apex; basal appendage deflexed, linear-tapered, c. 2 mm long, sparsely ciliate, curved up at the apex, trilobed. *Column* 7-8 mm long, angled away from the ovary at about 45° at the base then obliquely erect, light green. *Column wings* c. 2.5 mm long; basal lobe c. 1 mm long, at an angle of c. 70°; anterior margin curved, obtuse; inner margin and apex adorned with short white cilia; mid-section c. 1 mm long, green; apical lobe linear-tapered, c. 0.9 mm long. *Anther* c. 1 mm long, obtuse. *Pollinia* linear, c. 1 mm long, falcate, mealy, yellow. *Stigma* central, elliptical, c. 3.5 mm long, c. 0.8 mm wide, raised. *Capsule* not seen. **Fig. 5.**

Distribution and ecology: Widespread and common in lower rainfall inland areas (less than 500 mm annual rainfall) of Western Australia from north of the State Barrier Fence on the North West Coastal Highway to Balladonia and west to Brookton. Also extends into inland



***Diplodium setulosum* - Bank Rock, WA (CJF)**



***Diplodium setulosum*, Jackson Rock, NNE of Lake King, WA, Andrew Brown.** (Fig. 5.)
a. flowering plants; b. flower from front; c. flower from side; d. labellum; e. column from front; f. column and labellum from side; g. stigma; h. pollinium; i.synsepalum; j. petal.
© D.L.Jones, drawn 4 Sep. 1986.

areas of South Australia, perhaps extending close to the coast in some areas. Grows in a very wide range of habitats including creeklines, woodland, forest, shrubland, margins of granite rocks, rocky hills and around salt lakes. Flowering July to September.

Similar species: This species is part of a complex of similar looking hairy-stemmed taxa that extend through South Australia into north-western Victoria and perhaps also into western New South Wales. Within the southern parts of its range, especially in higher rainfall regions and nearer the coast, the plants become shorter, with smaller flowers (further study is required to determine if these plants are in fact undescribed, closely related taxa). *Diplodium echinulatum* occurs within the range of *D. setulosum* but is shorter with scabrid leaf margins, a densely hairy scape, smaller flowers and earlier flowering period.

Notes: This new species is listed on Florabase (https://florabase.dpaw.wa.gov.au) as *Pterostylis* sp. inland (A.C. Beauglehole 11880). It is the most widespread and most common taxon within the *D. nanum* complex in Western Australia. In good seasons, it often presents itself in dense and extensive colonies that look impressive when in massed flower. In poor seasons, flowering plants can be difficult to find and are often depauperate.

Conservation status: Widespread and well conserved.

Etymology: The Latin *setulosus*, minutely setose, referring to the numerous hair-like trichomes present on the scapes and ovaries of this species.

Other specimens: WESTERN AUSTRALIA, Austin District: Yalgoo North Road, 75 km N of Yalgoo, 13 Aug. 1998, *G.Brockman (GBB 382)* (PERTH 05216265); Camel Soak E of Rabbit Fence Road, N of Wanarra Road, E of Perenjori, 14 Aug. 2008, *G.Brockman (GBB 2276)* (PERTH 08049483); Old Rothsay Road, causeway N of new road to Warriadar, NE of Perenjori, 14 Aug. 2008, *G.Brockman (GBB 2278)* (PERTH 08049424); Yalgoo - Mullewa Road, 1.7 km E of Gabyon Tardie Road, NW of Yalgoo, 14 Aug. 2015, *G.Brockman (GBB 2719)* (PERTH 08420041); On the W side of the Caron Dam parking area, 18 Aug. 2008, *G. Byrne 3609* (PERTH 08119783); Rainy Rocks on Lake Barlee Road, 5 km from corner with Evanston/Menzies Road, 12 Aug. 2001, *P.Johns 167* (PERTH 06898807); Coolgardie District: 28.6 km NE of Norseman along Eyre Highway, (28.6 km from junction of Coolgardie - Esperance Highway), Track on N side of highway, travel 0.5 km to site, 16 Aug. 2003, *B.Archer 2346* (PERTH 08262322); Victoria Rock Nature Reserve near Coolgardie, 7 Jul. 1990, *G.Barrett* (PERTH 01152998); 98.1 km E of Norseman on Eyre Highway, 16 Aug. 1999, *R.J. Cranfield 10071* (PERTH 04390679); East side of track, c. 3.5 km NNW of Bungalbin Hill. Helena Range. [Plot HTB02], 27 Jul. 1995, *N.Gibson & M.Lyons 2860* (PERTH 05385075); 50 m W of Bullfinch-Diemals Rd, on crest of Die Hardy Range, 14 Aug. 1998, *P.Johns 34* (PERTH I05526086); Granite outcrop on Bullfinch-Diemals Rd, 47 km NNE of Bullfinch, 15 Aug. 1998, *P.Johns 38* (PERTH 05526078); Binyarinyinna Rock, ca 50 km E of Widgiemooltha, 16 Aug. 1981, *K. Newbey 8550* (PERTH 08265798); Irwin District: 26.1 km W along State Barrier Fence Access (S of fence) track W from NW Coastal Highway. Track leaves fence at 24.7 km, 30 Jul. 1996, *G.J. Keighery & N.Gibson 1944* (PERTH 05016118); Avon District: Carnamah, 11 Aug. 1961, *M.C.George* (PERTH 08265860).

Acknowledgements

Much appreciation to Emma Toms for help with specimens at CANB; also the directors and curators at CANB and PERTH for giving us access to specimens. We also thank Jean Egan for preparing David Jones's drawings for publication, Mark Clements, Marion Garrett and Karina Richards for technical assistance. Special appreciation to Garry Brockman, Andrew Brown, Nye Evans, Barbara Jones, Marie French and the late Bill Jackson for companionship on field trips.

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Champion Orchids and Awards (Rewards?) for Revenue

by David Banks

The following snippets of information appeared in the *OSNSW News,* September 2018. As a follow on from my article "How do you select the Grand Champion Orchid of a Show?" published in the October-November 2018 issue of the *AOR*, some of my suspicions are confirmed.

There were six (6) orchids granted higher awards (Award of Merit) than the *Paphiopedilum micranthum* (Highly Commended Certificate) selected as Grand Champion Orchid of the Show, at the recent Australian Orchid Conference held in Windsor. Many would see this as a parallel to the 7th placed runner being gifted a Gold Medal. This does not take into consideration the three plants granted awards then rejected by their owners, or many other orchids on display either previously awarded or of a subsequent high standard.

Many orchid administrators appear to be encouraging the granting of awards as revenue raisers. In his "Registrars Report" from the minutes in the same *OSNSW News,* it stated: "Ian told members that NSW had awarded some 85 orchids, down a little from the previous year. Irene said that any reduction in awards from NSW and Queensland had a flow on affect of reduced income for the AOC."

Which begs the question, "Have quality orchid awards essentially lost their relevance, value and prestige"? ■

David Banks
Email: david@hillsdistrictorchids.com

Registrars report
Awards
The report is dominated by the Australian Conference

- Paph. TB Lorna Doon 'Karawar' AM 80 pts Treva Burnett WA (Cut Flower)
- Bulb. fletcherianum 'Jessie' AM 83 Bill and Jan Miles Vic
- Masd. Chilli Falcon 'Neve' AM 81 pts John Allen
- Den. Tweetas 'Neville' AM 82 David Hemmings
- Den. Wamberal 'Deniston Fog' AM 82 David Hemmings
- Ptst. nutans x baptistii AM/ACM 82 Karen Groeneveld
- Ptst. curta 'JAM' HCC 79.5 ACM 82 Joyce Stone
- Paph. TB JAmes 'Yellow Orb' HCC 75 Craig Miles
- Den. Wesley Pink 'Denistone Goldstrike' 79pts HCC David Hemmings
- Paph. micrantum f. eburneum '????' 79 HCC Seong Tay

3 other plants were considered worthy of awards, but were rejected by the owner.

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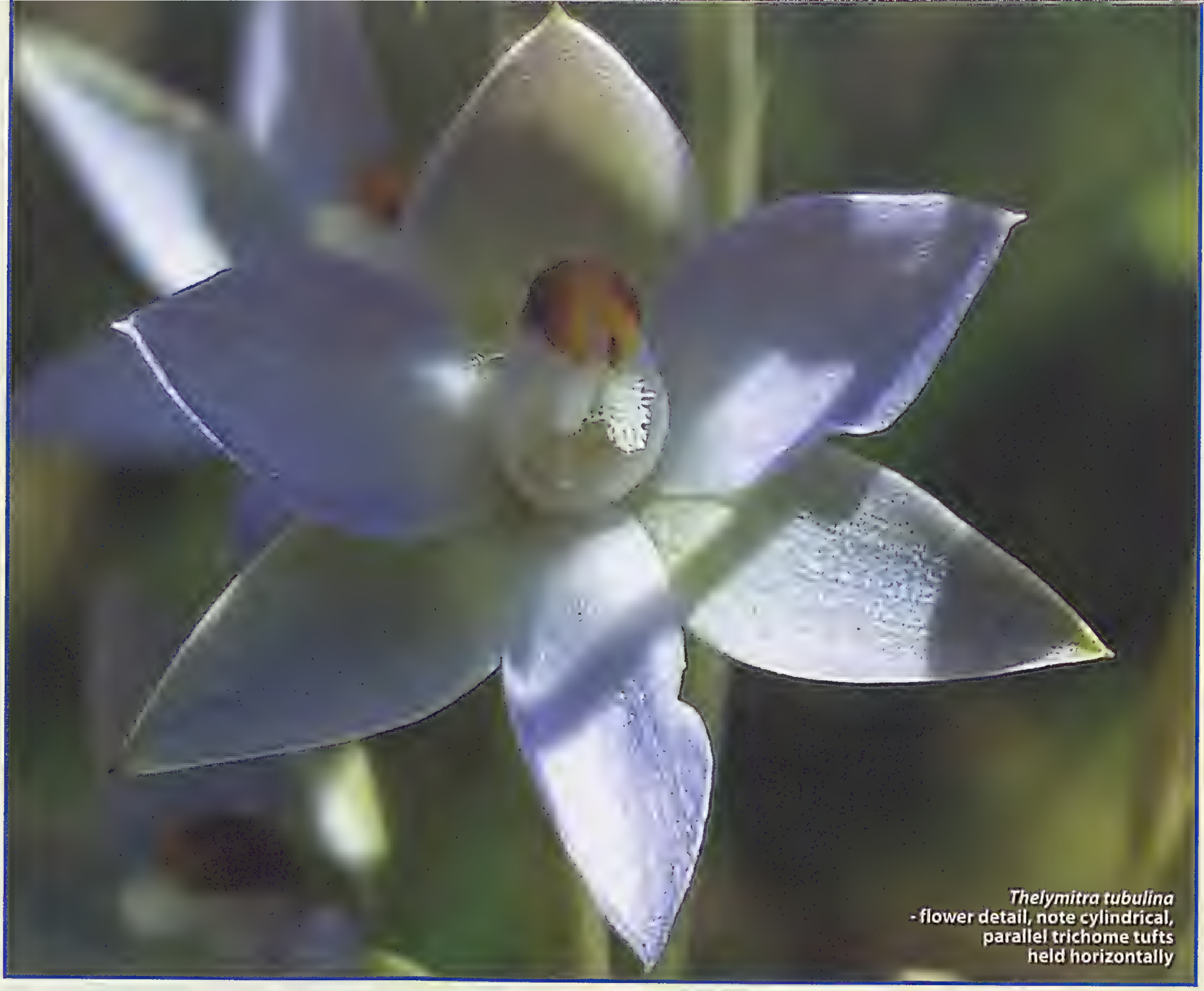


Thelymitra tubulina - flower detail, note cylindrical, parallel trichome tufts held horizontally

Thelymitra tubulina a new species of Sun Orchid (Orchidaceae) from South Australia

Text and photos by Robert J. Bates

Abstract

Thelymitra tubulina, a member of the mostly small blue flowered *Thelymitra pauciflora* R.Br. complex is here described as new. Notes are provided on its distribution ecology and conservation status; distinguishing features are compared with those of allied taxa.

Key words: *Thelymitra tubulina*, new species, orchid, South Australia, Australian flora.

Introduction

Many groups of Australian *Thelymitra* have been revised this century by J. Jeanes (2004 etc). including the *Thelymitra pauciflora* group. Bates (2010) described new South Australian taxa and mentioned others yet to be published. Bates & Weber (1990) treated *Thelymitra pauciflora* and illustrated others at the time unnamed although since resolved. The species named here, although no illustrations were found in the literature has been known to the author since the 1990s; a suitable type collection was made in 2018 from a well-known population near Morialta Conservation Park in the Adelaide Hills.

Materials and methods

The description below was made from fresh material which was photographed, recorded and collected by the author.

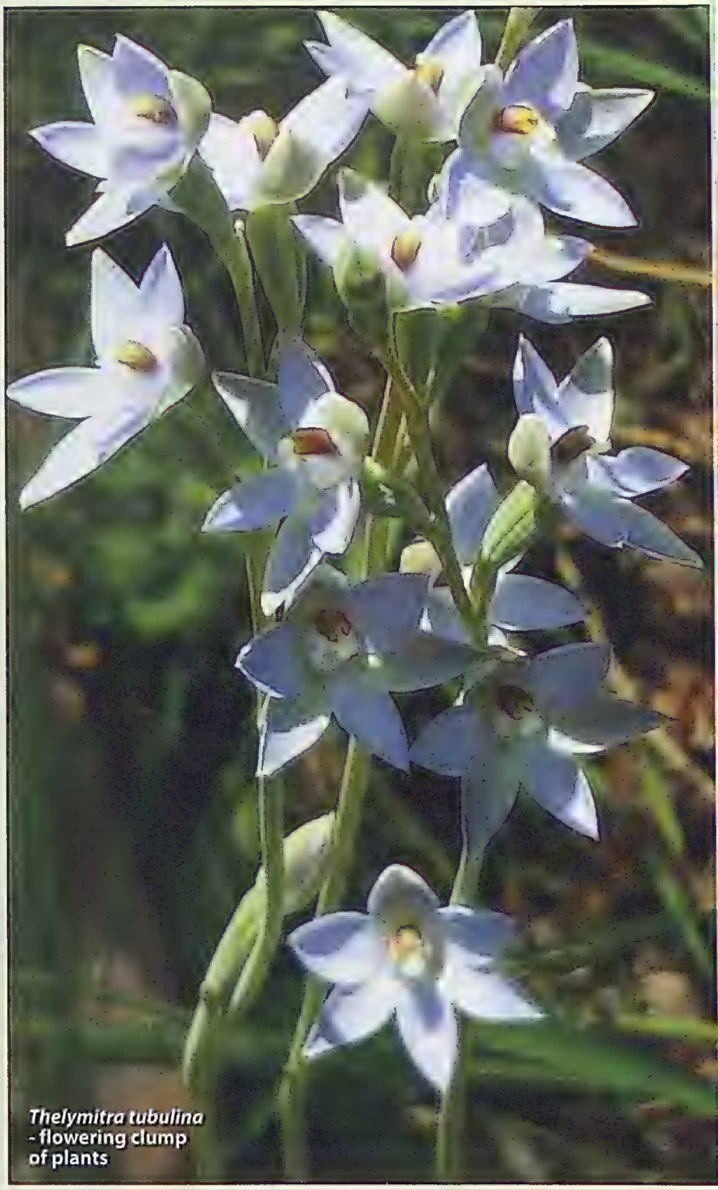
TAXONOMY

Thelymitra tubulina R.J. Bates ***sp. nov.*** with affinity to *Thelymitra pauciflora* R.Br. but differing in the many, larger, lavender blue flowers contrasting with the few, tiny blue flowers of *Thelymitra pauciflora.* The *column (gynostemium)* of *Thelymitra tubulina* differs in its narrow, curved, tubule-like, orange to brown *post anther lobe* with tiny yellow orifice and cylindrical, parallel trichome tufts held horizontally; compared to the short, broad, mostly yellow, sub erect post anther lobe of *Thelymitra pauciflora* with its globular trichome tufts held erect. The leaves of *Thelymitra tubulina* are angular in cross-section and often grouped in a tussock, while the leaf of *Thelymitra pauciflora* is usually solitary and rounded in cross-section.

TYPE: **South Australia**, Southern Lofty region, east of the Morialta Cons. Park boundary below Moore's Rd. October 2018, *R.J. Bates 97888* (holo AD, iso CANB).

Description: tuberous vernal terrestrial orchid 12-28 cm tall. *Tuber* not seen. *Leaf* linear, erect, 4-12 cm long, 2-5 mm wide, bright green often pink at base, canaliculate with an angular dorsal rib. *Scape* filiform 10-28 cm tall, 0.8-1.0 mm wide, pink. *Inflorescence* of 2-8 pale lilac or blue flowers, the *rachis* pink or green. *Sterile bract* one, lanceolate acuminate 5-8 mm long c. 2 mm wide, sheathing; *fertile bracts* similar but shorter and loose, green. *Pedicels* 2-5 mm long, slender and obliquely erect. *Ovary* narrow obovoid 5-8 mm long, 2.5-4 mm wide, strongly ribbed, green, standing out from scape. *Flowers* 10-22 mm across, pastel blue to pale lilac with 5-8 indistinct lines, opening on warm humid days; *perianth segments* 5-10 mm long, 3-4 mm wide concave to convex depending on conditions, acute. *Sepals* greenish outside, with pale lilac or blue edges; *dorsal sepal* ovate, sub-erect and partly hooding the column, shorter than other segments; *lateral sepals* ovate lanceolate, slightly asymmetric, acute; *petals,* shortly ovate, thin textured, broader than sepals, obtuse. *Labellum* smaller than other segments but similar, lanceolate depressed. *Column* erect from end of ovary, palest blue or white, 4-5 mm long, c. 2.5 mm wide; *post anther lobe* hooding the anther, tubular 1.2-1.5 mm long, 0.7-0.8 mm wide, orange to brown, curved strongly forward from near base, not inflated, apex tinged yellow with a tiny, irregular notch. *Lateral lobes* porrect at base then parallel, thrust forward, *trichomes* white, short and curly, c. 0.3 mm long, in dense, often elongate, terminal, horizontal brushes. *Anther* inserted midway along column, 1.8-2.2 mm long, 1.2 mm wide, *connective* produced into an apical beak 0.3 mm long, c. 0.2 mm wide, *viscidium* circular; *pollinia* friable, white. *Stigma* at base of column, quadrate, c. 1 mm wide, margins neat. *Capsules* c. 9-12 mm long, 5-8 mm wide, green, drying dark.

Distribution and ecology: Endemic to South Australia in higher rainfall districts of the Southern Lofty and South-eastern regions. Favours poorer, gravelly or sandy soils in rough bush, usually with native lilies and many other sun orchid species including the white flowered *T. albiflora,* lilac flowered *T. brevifolia,* blue flowered *T. bracteata* and the pink *T rubra*. Possibly also in western Victoria where similar habitat exists.



***Thelymitra tubulina* - flowering clump of plants**

Phenology: flowers mostly in October and blooms more freely after bushfires. Flowers do outcross but will also self-pollinate when warm days are lacking.

Recognition: Plants form clumps of leaves and the flowers are mid-sized, in pastel tones of blue or lilac while the combination of tiny, narrow, curved, tubular post-anther lobe with orange or soft brown colours and tiny, angular yellow orifice, together with sub cylindric, parallel horizontal trichome tufts will complete its identity.

Conservation status: probably rare, although It is difficult to assess self-pollinating sun orchids like *Thelymitra tubulina* as their flowers are infrequently seen open for identification.

Etymology: from the Latin *tubule* 'small or narrow tube, as part of a plant or animal', in reference to the small slender tube formed by the post anther lobe.

Acknowledgements

I am grateful for the assistance of Juergen Kellerman at AD who processed the Types and my wife Novi for technical assistance.

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Robert J. Bates
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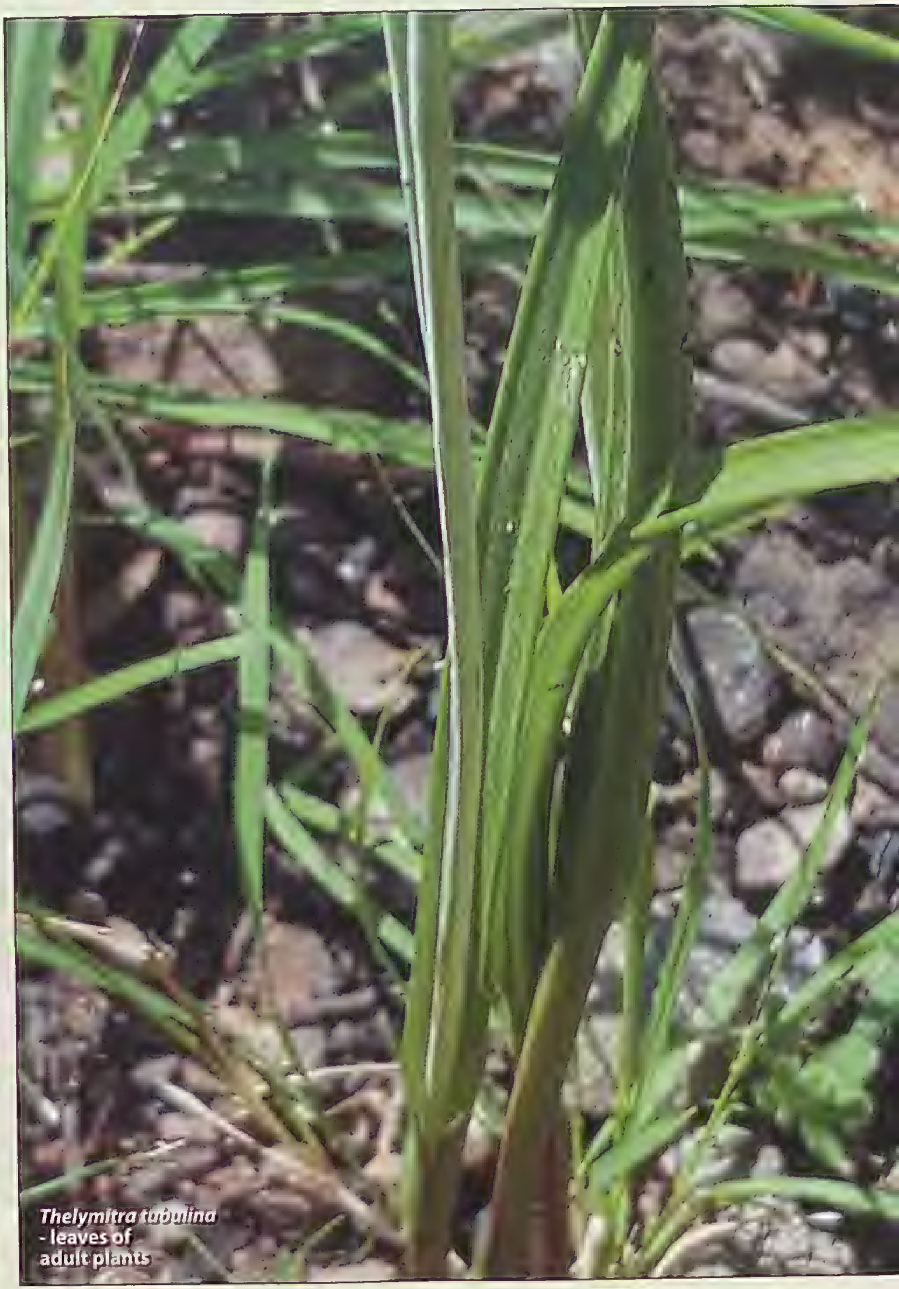

***Thelymitra tubulina* - leaves of adult plants**

Australian Orchid Review

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AOR 111

Notes on Australasian Orchids 3: Nomenclatural Adjustments in the Tribe Gastrodieae (Orchidaceae); New combinations in *Demorchis* and *Neoclemensia* and the erection of the new genus *Leptogastrodia*

by Mark A. Clements and David L. Jones

Abstract

Morphological and preliminary molecular based research of the terrestrial obligate holomycotrophic, achlorophyllus group of orchids tribe Gastrodieae including both *Gastrodia* R.Br and *Demorchis* D.L.Jones and M.A.Clem. reveal that *Gastrodia* as currently interpreted was likely poyphyletic. A new classification of this assemblage of species is proposed with the recognition of *Gastrodia*, *Demorchis*, reinstatement of the genus *Neoclemesia* C.E.Carr to accommodate two species and the description of a new genus *Leptogastrodia* M.A.Clem. & D.L.Jones for a group of species that otherwise does not fit within the concepts of any of the preceding genera. Species from *Gastrodia* are either retained in or transferred to the appropriate genera.

Introduction

Tribe Gastrodieae Lindl. is a small group of terrestrial obligate holomycotrophic, achlorophyllus orchids consisting of six genera with a scattered pan-tropical, sometimes temperate distribution (Kores *et al.* 2005). Amongst this assemblage is *Gastrodia* R.Br. the largest genus comprising over 70 species that inhabit forests throughout SE Asia, Japan and Siberia, Malesia, Africa, Madagascar and the Mascarene Islands, Solomon Island, New Caledonia, Australia and New Zealand, (Cribb *et al.* 2010, Martos *et al.* 2015, Lehnbach *et al.* 2016).

Historically *Gastrodia* was treated as comprising a few to 20 species (Kores *et al.* 2005) with much attention centered on *G. elatum* Blume and its medicinal properties and uses in traditional Chinese medicine. More recently there has been a flurry of activity with the description of many more species particularly originating from the forests of South East Asia (Hsu & Kuo 2010, 2011, Yeh *et al.* 2011, Hsu *et al.* 2012, Tan *et al.* 2012, Suetsugu 2013, 2014, Hu *et al.* 2014). Party to the classification of the Gastrodieae was the recognition and description of the genus *Demorchis* (Jones and Clements 2004) to accommodate the morphologically distinct *G. queenslandica*, a position not accepted by some contemporary botanists, *e.g.* Gray (2017). Moreover, recent broadly based molecular phylogenetic studies of orchids from SE Asian and Africa have included data on several species of *Gastrodia* (Li *et al.* 2015) whilst the mycorrhizal partners and relationships have also been the focus of some intensive research (Martos *et al.* 2009, Shimaoka *et al.*, 2017). Although not specifically focused on the phylogeny of the Gastrodieae, these studies nevertheless provide sufficient background data to suggest that *Gastrodia* was likely not monophyletic or at least warranting further detailed study. Our own studies on the Gastrodieae were undertaken using stored data including previous study of the types whilst visiting various overseas herbaria, or through the media of digital imaging of original descriptions and types through JSTOR as well as study of living material whenever possible.

The purpose of this paper is to provide a report on those preliminary research findings, and update the classification of this group or orchids and to provide a framework for future research particularly molecular research on this unique and interesting group of orchids, the Type or first named species of which happens to have originated from Australia.

Taxonomy

1. ***Demorchis*** M.A.Clem. & D.L.Jones, *Orchadian* 14(8): Sci. Suppl. xiii (2004). Type species: *Gastrodia queenslandica* Dockrill.

Description: Perennial, leafless, geophytic, glabrous, leafless *herbs*, mycoheterotrophic, sympodial. *Rhizomes* fleshy, subterranean, thin, elongate, smooth, single, mostly horizontal, lasting many years. *Roots* filamentous, arising from the apex of the rhizome. *Inflorescence* racemose, terminal, 1-2-flowered. Peduncle longer than the rhachis, thin, brownish. *Sterile bracts* semi-tubular, base sheathing. *Floral bracts* very small, sheathing. *Pedicel* short, thin, distinct from the ovary. *Ovary* straight, smooth. *Flowers* resupinate, campanulate, brownish or yellowish, porrect, lasting 1-2 days. *Perianth segments* thick, fleshy, connate throughout with free tips, smooth. *Dorsal sepal* fused with the lateral sepals and petals, similar to the lateral sepals, concave. *Lateral sepals* fused with the dorsal sepal and petals, similar to the dorsal sepal, concave, externally keeled, sometimes with an internal rugose area near the apex. *Petals* small, fused with the sepals, the tips free. *Labellum* attached to the apex of the column foot and partly fused with the bases of the lateral sepals, markedly dissimilar in size and shape to the sepals and petals, ecalcarate. *Labellum lamina* divided into a hypochile and epichile; *hypochile* short, narrow, with 2 densely tuberculate basal calli; *epichile* broadly expanded, with smooth margins; ventral surface smooth; apex narrow. *Spur* absent. *Callus* consisting of 2 short, tall, narrow, smooth ridges near the labellum apex. Nectar unknown. *Column* porrect from the end of the ovary, relatively long, fleshy, lacking free filament and style.

Column wings running the length of the column, extending above the anther as narrow stelidia. *Column foot* short. Pseudospur absent. *Anther* terminal, incumbent, rostrate. *Pollinarium* absent. *Pollinia* 2, narrow, deeply grooved, often fragmenting, coarsely sectile, yellow. *Viscidium* absent. *Rostellum* flat, entire, plate -like, projecting. *Stigma* basal, concave. *Capsules* dehiscent, smooth, erect; peduncle elongated in fruit; pedicel elongated in fruit. *Seeds* numerous, light coloured, winged.

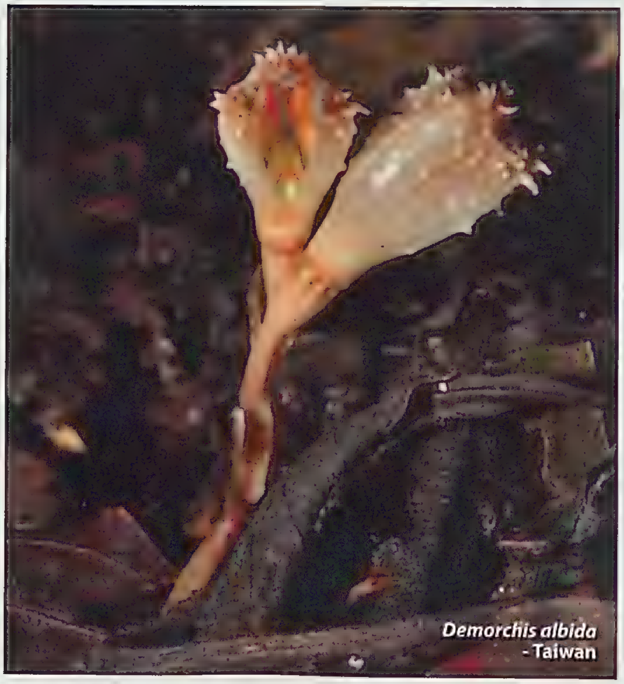
Distribution: Found in forest habitats throughout SE Asia including Japan and Siberia, Malesia including New Guinea, Solomon Islands, New Caledonia and NE Australia.

Species:

Demorchis abscondita (J.J.Sm.) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia abscondita* J.J.Sm., *Icon. Bogor*.: t. 103 (1903).

Demorchis africana (Kraenzl.) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia africana* Kraenzl., *Bot. Jahrb. Syst*. 28: 179 (1900).

Demorchis albida (T.C.Hsu & C.M.Kuo) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia albida* T.C.Hsu & C.M.Kuo, *Ann. Bot. Fenn*. 48: 272 (2011).



Demorchis albida - Taiwan

Demorchis albidoides (Y.H.Tan & T.C.Hsu) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: Y.H.Tan & T.C.Hsu, *Phytotaxa* 66: 38 (2012).

Demorchis appendiculata (C.S.Leou & N.J.Chung) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia appendiculata* C.S.Leou & N.J.Chung, *Quart. J. Exp. Forest*. 5(4): 138 (1991).

Demorchis bambu (Metusala) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia bambu* Metusala, *Phytotaxa* 317(3): 211-218 (2017).

Demorchis ballii (P.J.Cribb & Browning) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia ballii* P.J.Cribb & Browning, *Kew Bull*. 65: 317 (2010).

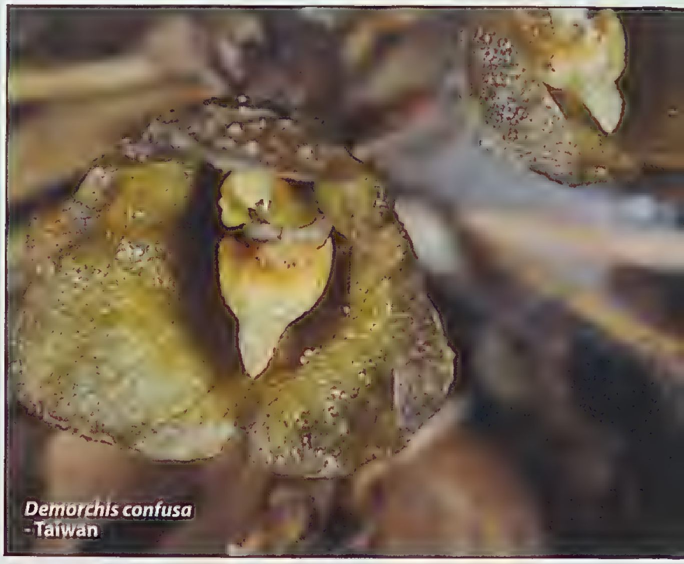
Demorchis boninensis (Tuyama) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia boninensis* Tuyama, *Bot. Mag*. (Tokyo) 53: 2 (1939).

Demorchis callosa (J.J.Sm.) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia callosa* J.J.Sm., *Repert. Spec. Nov. Regni Veg*. 29: 248 (1931).

Demorchis celebica (Schltr.) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia celebica* Schltr., *Repert. Spec. Nov. Regni Veg*. 10: 6 (1911).

Demorchis clausa (T.C.Hsu, S.W.Chung & C.M.Kuo) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia clausa* T.C.Hsu, S.W.Chung & C.M.Kuo, *Taiwania* 57: 271 (2012).

Demorchis confusa (Honda & Tuyama) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia confusa* Honda & Tuyama, *J. Jap. Bot*. 15: 659 (1939).



Demorchis confusa - Taiwan

Demorchis confusoides (T.C.Hsu, S.W.Chung & C.M.Kuo) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia confusoides* T.C.Hsu, S.W.Chung & C.M.Kuo, *Taiwania* 57: 273 (2012).

Demorchis crassisepala (L.O.Williams) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia crassisepala* L.O.Williams, *Amer. Orchid Soc. Bull*. 11: 211 (1942).

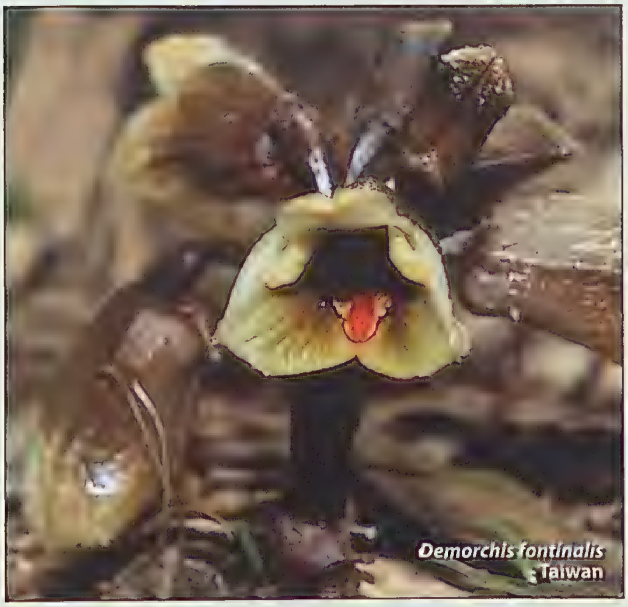
Demorchis crispa (J.J.Sm.) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia crispa* J.J.Sm., *Bull. Jard. Bot. Buitenzorg* (sér. 3), 3: 248-250 (1921).

Demorchis effusa (P.T.Ong & P.O'Byrne) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia effusa* P.T.Ong & P.O'Byrne, *Malesian Orchid J*. 10: 11-13, 15, F. 5-8, 10 (2012).

Demorchis flexistyla (T.C.Hsu & C.M.Kuo) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia flexistyla* T.C.Hsu & C.M.Kuo, *Taiwania* 55: 243-244, f. 1 (2010).

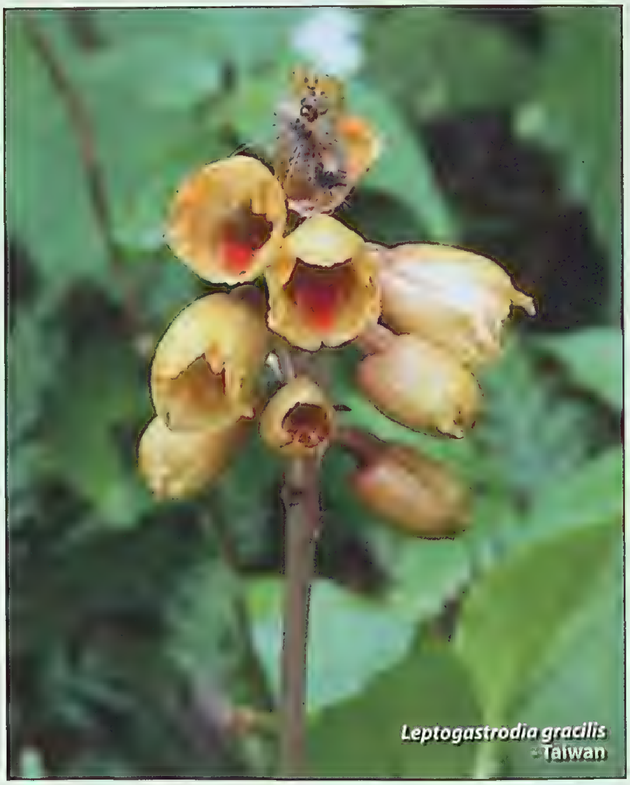
Demorchis flexistyloides (Suetsugu) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia flexistyloides* Suetsugu, *Phytotaxa* 175: 270-274, f. 1-2 (2014).

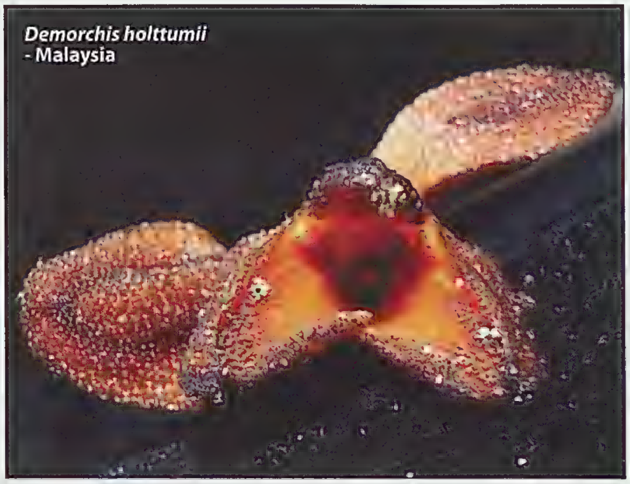
Demorchis fontinalis (T.P.Lin) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia fontinalis* T.P.Lin, *Native Orchids Taiwan* 3: 129 (1987).


Demorchis fontinalis
- Taiwan

Demorchis holttumii (Carr) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia holttumii* Carr, *Gard. Bull.* Straits Settlem. 5: 38 (1929).

Demorchis isabelensis (T.C.Hsu) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia isabelensis* T.C.Hsu, *Phytotaxa* 270: 138 (2016).

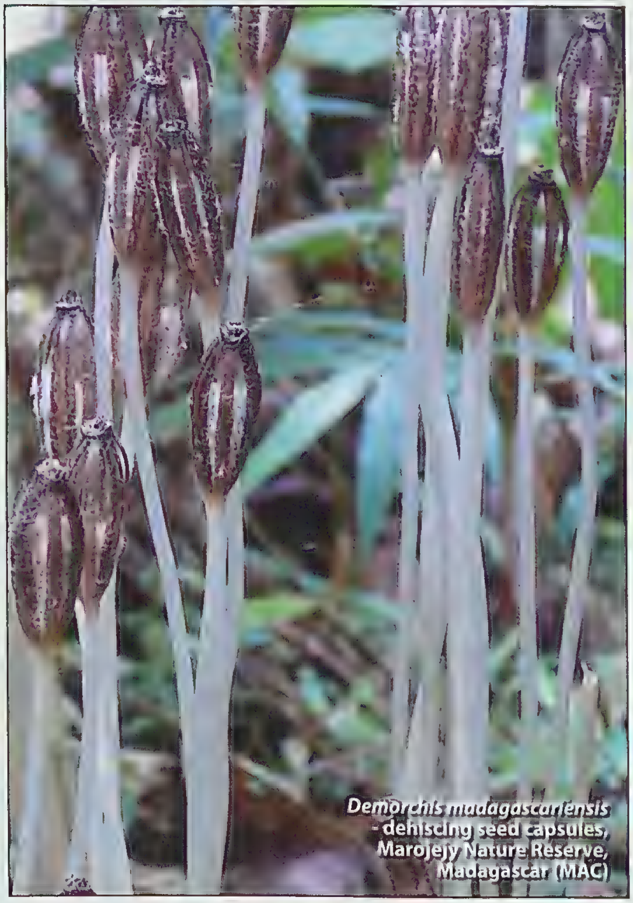

Leptogastrodia gracilis
- Taiwan


Demorchis holttumii
- Malaysia

Demorchis khangii (Aver.) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia khangii* Aver., *Taiwania* 63(3): 204, 209, f. 8 (2018).

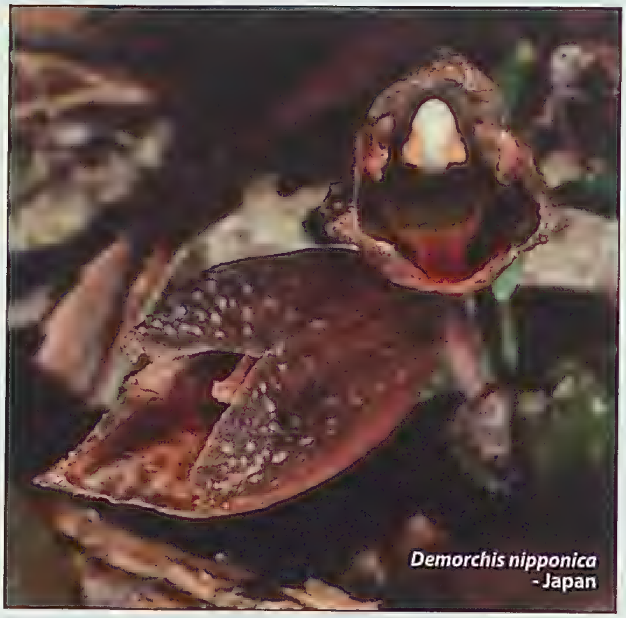
Demorchis kuroshimensis (Suetsugu) M.A.Clem. & D.L.Jones, *comb. nov.* Basionym: *Gastrodia kuroshimensis* Suetsugu, *Phytotaxa* 278: 248 (2016).

Demorchis madagascariensis (H.Perrier ex Martos & Bytebier) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia madagascariensis* H.Perrier ex Martos & Bytebier, *Phytotaxa* 221(1): 49 (2015).


Demorchis madagascariensis
- dehiscing seed capsules, Marojejy Nature Reserve, Madagascar (MAC)

Demorchis nantoensis (T.C.Hsu & C.M.Kuo ex T.P.Lin) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia nantoensis* T.C.Hsu & C.M.Kuo ex T.P.Lin, *Taiwania* 61: 99 (2016).

Demorchis nipponica (Honda) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Didymoplexis nipponica* Honda, *Bot. Mag.* (Tokyo) 46: 168 (1932).



Demorchis nipponica
- Japan

Demorchis nipponicoides (Suetsugu) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia nipponicoides* Suetsugu, *Phytotaxa* 302(3): 252-254, f.1-2 (2017).

Demorchis okinawensis (Suetsugu) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia okinawensis* Suetsugu, *Phytotaxa* 302(3): 254-256, f. 3-4 (2017).

Demorchis papuana (Schltr.) D.L.Jones & M.A.Clem., *Orchadian* 14(8: Sci. Suppl.): xiii (2004).

Demorchis pubilabiata (Y.Sawa) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia pubilabiata* Y.Sawa, *Res. Rep. Kochi Univ.*, 2, Nat. Sci. 29: 65 (1980).

Demorchis queenslandica (Dockrill) D.L.Jones & M.A.Clem., *Orchadian* 14(8): Sci. Suppl. xiii (June 2004).

Demorchis rwandensis (Eb.Fisch. & Killmann) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia rwandensis* Eb.Fisch. & Killmann, *Kew Bull.* 65: 317 (2010).

Demorchis sabahensis (J.J.Wood & A.L.Lamb) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia sabahensis* J.J.Wood & A.L.Lamb, *Malesian Orchid J.* 1: 139 (2008).

Demorchis selabintanensis (Tsukaya & Hidayat) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia selabintanensis* Tsukaya & Hidayat, *Phytotaxa* 273: 77 (2016).

Demorchis shimizuana (Tuyama) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia shimizuana* Tuyama, *Acta Phytotax. Geobot.* 33: 380 (1982).

Demorchis silentvalleyana (C.S.Kumar, P.C.S.Kumar, Sibi & S.Anil Kumar) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia silentvalleyana* C.S.Kumar, P.C.S.Kumar, Sibi & S.Anil Kumar, *Rheedea* 18: 109 (2008).

Demorchis similis (Bosser) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia similis* Bosser, *Adansonia*, sér. 3, 28: 52 (2006).

Demorchis solomonensis (T.C.Hsu) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia solomonensis* T.C.Hsu, *Phytotaxa* 270: 141 (2016).

Demorchis sui (C.S.Leou, T.C.Hsu & C.R.Yeh) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia sui* C.S.Leou, T.C.Hsu & C.R.Yeh, *Nordic J. Bot.* 29: 417 (2011).

Demorchis takeshimensis (Suetsugu) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia takeshimensis* Suetsugu, *Ann. Bot. Fenn.* 50: 375-378, f.1-2 (2013).

Demorchis tembatensis (P.T.Ong & P.O'Byrne) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia tembatensis* P.T.Ong & P.O'Byrne, *Malesian Orchid J.* 10: 8 (2012).

Demorchis theana (Aver.) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia theana* Aver., *Rheedea* 15: 90 (2005).

Demorchis umbrosa (B.Gray) D.L.Jones et M.A.Clem., *Austral. Orchid Review* 83(2): 63 (2018).

Demorchis uraiensis (T.C.Hsu & C.M.Kuo) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia uraiensis* T.C.Hsu & C.M.Kuo, *Taiwania* 55: 244-245, f. 2 (2010).

Demorchis verrucosa (Blume) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia verrucosa* Blume, *Mus. Bot.* 2: 175 (1856).

Demorchis zeylanica (Schltr.) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia zeylanica* Schltr., *Repert. Spec. Nov. Regni Veg.* 3: 77 (1906).

Demorchis* x *nippo-uraiense (Suetsugu & T.C.Hsu) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia x nippo-uraiensis* Suetsugu & T.C.Hsu, *Taiwania* 63 (3): 220-225, f. 1 & 2 (2018).

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2. *Gastrodia* R.Br., Prod. 330 (1810).
Type species: *Gastrodia sesamoides* R.Br.

Epiphanes Blume, *Bijdr.* 421 (20 Sep-7 Dec 1825).
Type species: *Epiphanes javanica* Blume

Gamoplexis Falconer, *Proc. Linn. Soc. London* 1: 320 (30 Apr 1847).
Type species: *Gamoplexis orobanchoides* Falconer

Description: Perennial, leafless, geophytic, glabrous *herbs*, mycoheterotrophic, sympodial. *Rhizomes* fleshy, subterranean, elongate, irregularly shaped, single, mostly horizontal, lasting many years; daughter rhizomes sometimes formed by fragmentation. *Roots* absent. Inflorescence a terminal raceme, few to many-flowered. *Peduncle* longer than the rhachis, fleshy, brownish, often with white dots. Sterile bracts tubular, sheathing, the lowest ones imbricate. Rhachis shorter than the peduncle, straight. Floral bracts small, spreading. Pedicel short, distinct from the ovary. *Ovary* twisted, smooth or verrucose. *Flowers* non-resupinate, well-spaced or crowded, tubular to campanulate, brown, yellowish or white, pendulous or erect, lasting a few days, opening sequentially in a spiral. *Perianth segments* connate throughout with free tips, fleshy, smooth or verrucose. *Dorsal sepal* fused with the lateral sepals and petals, similar to the lateral sepals, concave. *Lateral sepals* fused with the dorsal sepal and petals, similar to the dorsal sepal, concave. *Petals* fused with the sepals, the tips free, dissimilar to the sepals, often white, margins irregular, sometimes thickened. *Labellum* flexibly attached to the apex of the column foot and partly fused with the bases of the lateral sepals, markedly dissimilar in size and shape to the sepals and petals, ecalcarate. *Labellum lamina* divided into a hypochile and epichile; *hypochile* narrow at the base with thickened margins, often indented, dilated distally, sometimes with patches of marginal papillae; *epichile* broadly expanded, with crenulate, crispate or convolute margins; ventral surface papillate or covered with yellow pseudopollen; apex truncate or projecting. *Spur* absent. *Callus* consisting of 2 extremely irregular, straight, curved or convolute ridges covered in yellow pseudopollen, the ridges united towards the apex. *Nectar* absent. *Column* porrect from the end of the ovary, mostly long, rarely short, narrow, fleshy, lacking free filament and style. *Column wings* short, apical, blunt or dentiform. *Column foot* short, narrow. *Pseudospur* absent. *Anther* terminal, incumbent, erostrate. *Pollinarium* absent. *Pollinia* 2, narrow, deeply grooved, often fragmenting, coarsely sectile, yellow. *Viscidium* absent. *Rostellum* flat, entire, plate-like, projecting. *Stigma* basal, concave, circular. *Capsules* dehiscent, smooth or verrucose, erect; peduncle not elongated in fruit; pedicel not elongated in fruit. *Seeds* numerous, light coloured, winged.

Distribution: Found throughout the whole range of the tribe.

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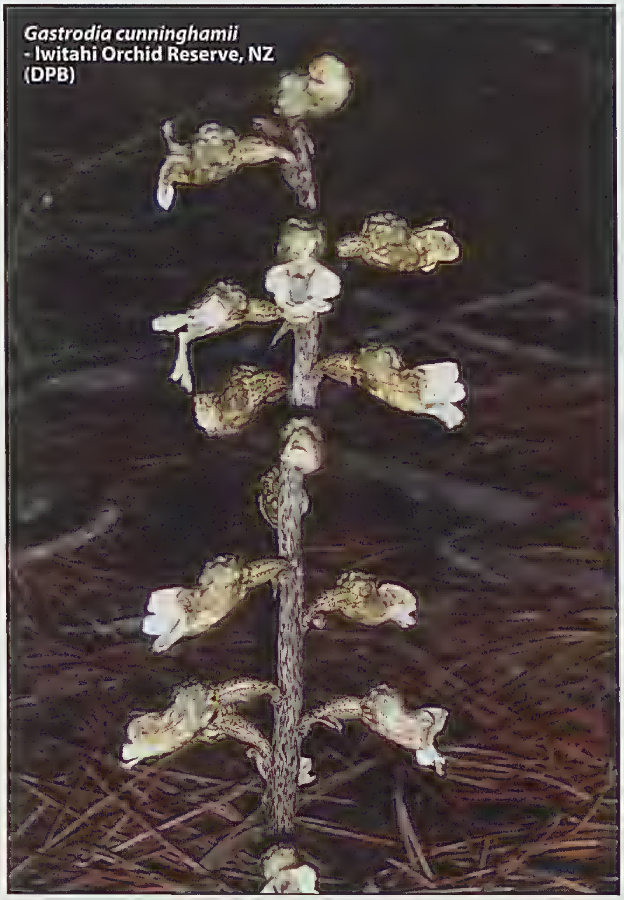
Species:

Gastrodia angusta S.Chow & S.C.Chen, *Acta Bot. Yunnan.* 5: 363-364, f. (1983).

Gastrodia cooperae Lehnebach & J.R.Rolfe, *Phytotaxa* 277(3): 242-244, f. 4, 5 (map) (2016).

Gastrodia crebriflora D.L.Jones, *Austral. Orch. Res.* 2: 62-63, f. 81 (1991).

Gastrodia cunninghamii Hook.f., *Fl. Nov.-Zel.* 1: 251 (1853).



Gastrodia cunninghamii
- Iwitahi Orchid Reserve, NZ
(DPB)

Gastrodia damingshanensis A.Q.Hu & T.C.Hsu, *Phytotaxa* 175: 256-262, f. 1-3 (2014).

Gastrodia elata Blume, *Mus. Bot.* 2: 174 (1856).

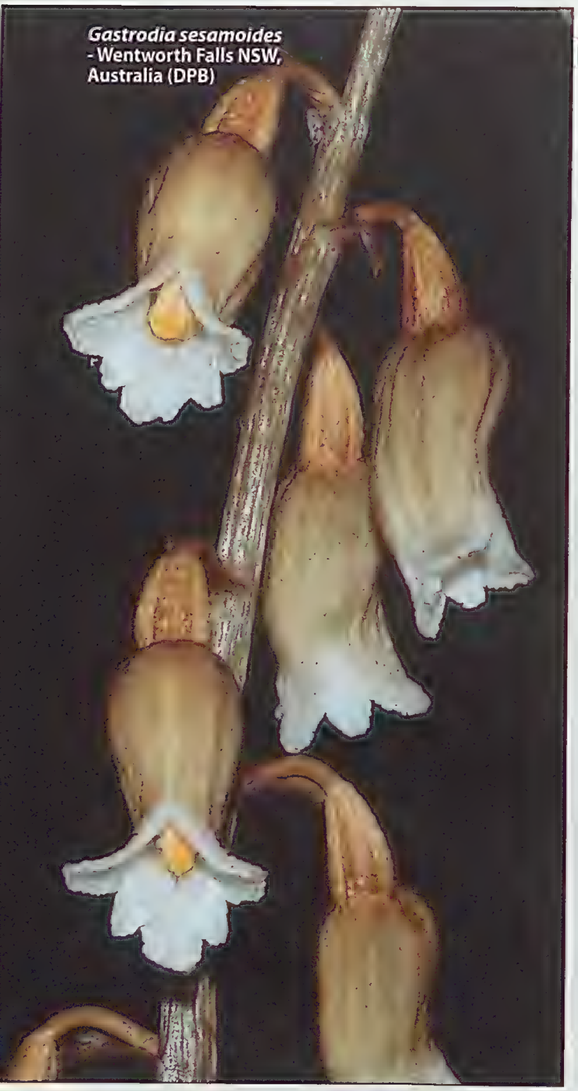
Gastrodia falconeri D.L.Jones & M.A.Clem., *Orchadian* 12: 350 (1998).

Gastrodia javanica (Blume) Lindl., *Gen. Sp. Orchid.* Pl.: 384 (1840).

Gastrodia lacista D.L.Jones, *Austral. Orch. Res.* 2: 64, f. 83 (1991).

Gastrodia minor Petrie, *Trans. & Proc. New Zealand Inst.* 25: 273 (1892 publ. 1893).

Gastrodia mishmensis A.N.Rao, Harid. & S.N.Hedge, *Arunachal Forest News* 9: 10 (1991).



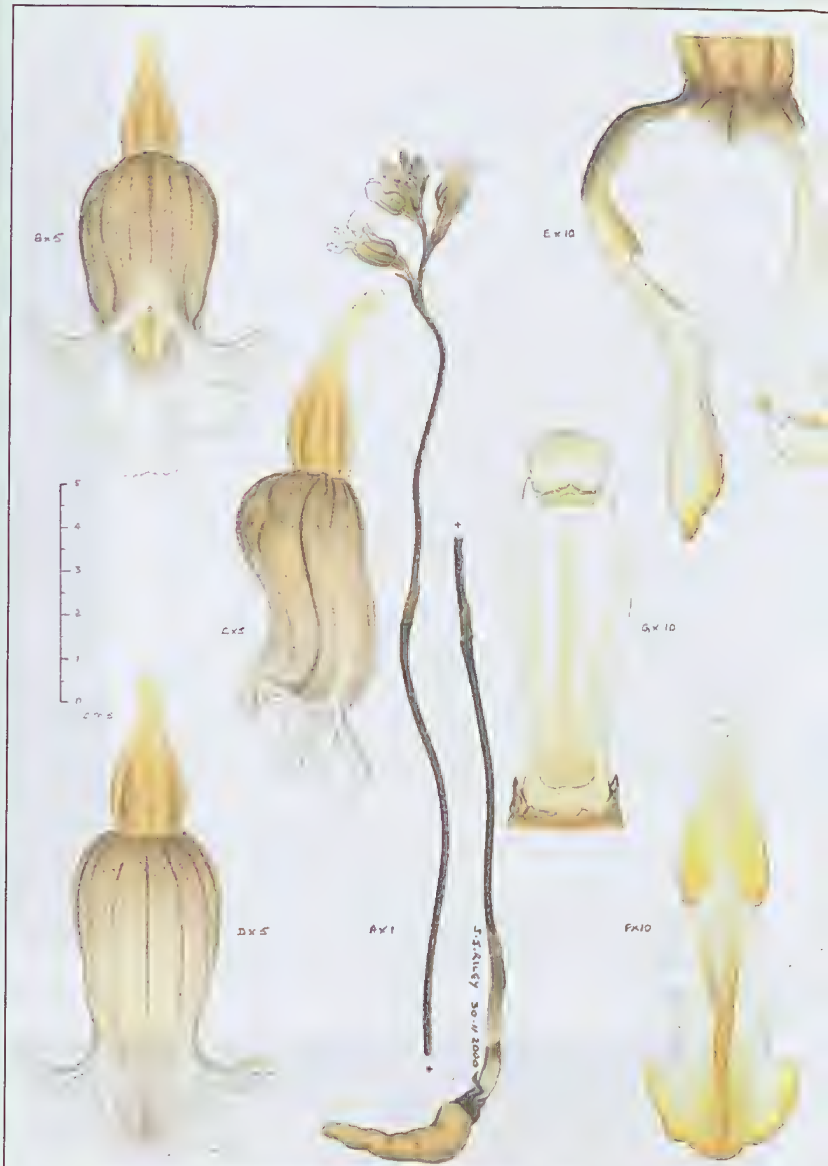
Gastrodia sesamoides - Wentworth Falls NSW, Australia (DPB)

Gastrodia molloyi Lehnebach & J.R.Rolfe, *Phytotaxa* 277: 244-246, 248, f. 6, 7 (map) (2016).

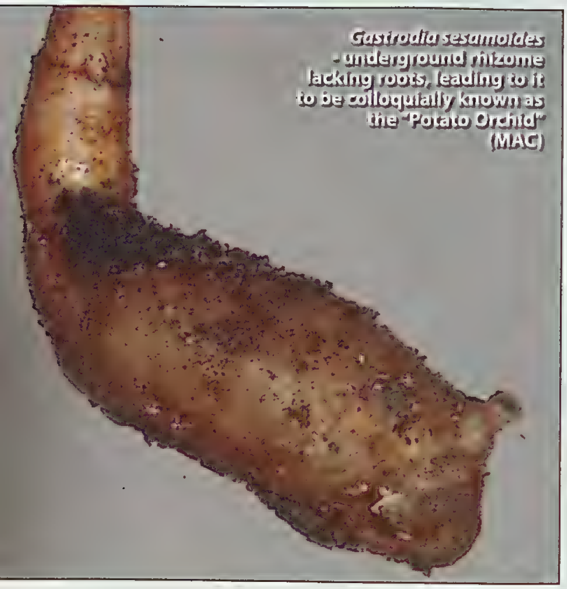
Gastrodia phangngaensis Suddee, Sirim. & Chamch., *Fl. Thailand* 12(2): 529 (2014).

Gastrodia procera G.W.Carr, Indig. *Fl. Fauna Assoc. Misc. Paper* 1: 22 (1991).

Gastrodia sesamoides R.Br., *Prod.* 319 (1810).



Gastrodia sesamoides (original drawing by John Riley)



Gastrodia sesamoides - underground rhizome lacking roots, leading to it to be colloquially known as the "Potato Orchid" (MAC)

Gastrodia surcula D.L.Jones, *Orchadian* 15(12): 554, t. (June 2008).

Gastrodia tuberculata F.Y.Liu & S.C.Chen, *Acta Bot. Yunnan.* 5: 76, f. 1 (1983).

Gastrodia urceolata D.L.Jones, *Austral. Orch. Res.* 2: 64-65, f. 84 (1991).

Gastrodia vescula D.L.Jones, *Austral. Orch. Res.* 2: 65, f. 85 (1991).

3. *Neoclemensia* C.E.Carr, *Gard. Bull.* Straits Settlem. 8: 180-181 (24 Jun 1935).

Type species: *Neoclemensia spathulata* C.E.Carr

Description: Perennial, leafless, geophytic, glabrous *herbs*, mycoheterotrophic, sympodial. *Rhizome* cylindric, villose, stout, part present c. 2.5 cm. long, c. 0.8 cm. diam. *Inflorescence* erect, very laxly c. 3-flowered, apparently purplish in colour; peduncle terete with c. 6 tubular sheaths at intervals c. 10 cm. long; rachis c. 4.25 cm. long. *Sterile bracts* appressed to the peduncle, lanceolate, subacute, 75 mm. long, c. 30 mm. wide. *Flowers* campanulate, c. 2.5 cm. long. *Sepals* adnate into a tube, free and recurved c. a third below the apex, white, free part warty and wrinkled outside. *Dorsal sepal* in all c. 3.4 cm. long, free part suborbicular or oblong-ovate minutely bidentate c. 1.3 cm. long c. 1.5 cm. wide. *Lateral sepals* in all c. 3.5 cm. long, free part ovate obtuse keeled outside margins incurved c. 1.4 cm. long c. 1.6 cm. wide. *Petals* adnate at the base to the lateral sepals for c. 0.15 cm., remainder free, much shorter than the sepals, linear, abruptly dilated near the apex into an ovate or suborbicular rather long-fimbriate blade, fleshy, 3-nerved, bright orange, c. 1.3 cm. long, spathulate part including the fimbriae c. 0.25 cm. long c. 0.35 cm. wide. *Labellum* adnate to the base of the column, entire. *Labellum lamina* clawed, dull coloured, 3-nerved, narrowly elliptic, obtuse, transversely rugulose with a short median bilobed keeled in the distal half; margins erect, minutely erose, papillose, folded; claw oblong or subquadrate, with paired apical, subglobose, papillose calli. *Column* stout, with two parallel keels from the rostellum to the apex of the stigma; column arms erect, triangular, acute, flattened towards the apex. *Clinandrium* suborbicular, deeply excavated. *Stigma* oblong, borne above the base in the manner of *Gastrodia*, keeled inside. *Anther* subquadrate, retuse, 2-celled. *Ovary* clavate, dull purple.

Leafless mycoheterotrophic saprophytes with the habit of *Gastrodia*. Rhizome cylindric, villous. Inflorescence few-flowered. Sepals adnate into a tube, apex free. Petals adnate to the sepals at the base only, remainder free, much shorter than the sepals. Lip adnate to the base of the column, entire, base bicallose. Column similar to that of *Gastrodia*, the stigma borne above the base. Anther subquadrate, 2-celled.

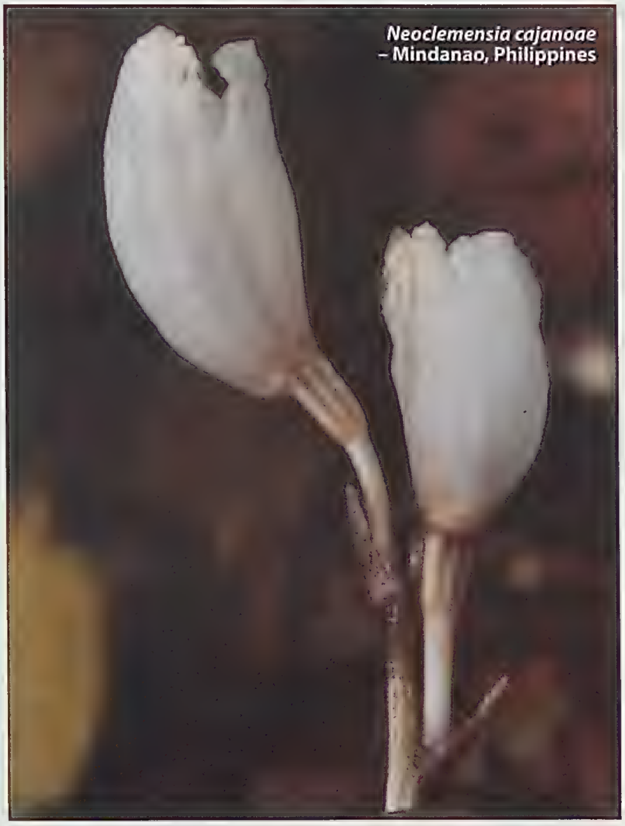
Distribution: Presently known only from a restricted area in Malesia and SE Asia.

Notes: In describing the genus Carr noted that "This new genus is very close to *Gastrodia* from which it differs principally in the fact that the petals are almost entirely free and much shorter that the sepals."

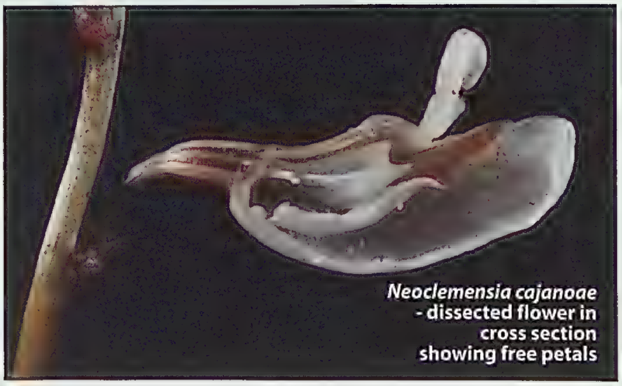
Species:

Neoclemensia cajanoae (Barcelona & Pelser) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia cajanoae* Barcelona & Pelser, *Phytotaxa* 266: 53 (2016).

Neoclemensia spathulata Carr, *Gard. Bull.* Straits Settlem. 8: 180 (1935).



***Neoclemensia cajanoae* – Mindanao, Philippines**



***Neoclemensia cajanoae* - dissected flower in cross section showing free petals**

4. *Leptogastrodia* M.A.Clem. & D.L.Jones, *gen. nov.*

Affinity with *Gastrodia* R.Br. but differing by presence of roots from apex of rhizome, narrow and sparsely flowered inflorescences and the elongation of the pedicel in capsules; also with affinity to *Demorchis* D.L.Jones & M.A.Clem. but differing by the thin membranous sepals; also with *Neoclemesia* C.E.Carr but differing by the fusion of the petals for most of their length to the connate, tubular sepals. Type species: *Gastrodia exilis* Hook.f., here designated.

Description: Terrestrial, leafless, mycoheterotrophic *herbs*, fragile. *Rhizomes* single, oblong-obovate, horizontal, densely hairy, with 2 – 3 nodes and scales in concentric rows; *scales* brown, triangular (ovate)-lanceolate, sparsely hairy, apex acuminate. *Roots* few. *Scape* erect, with 3 – 12 internodes, faintly grooved, glabrous, dark brown; lower internodes shorter with imbricating bracts; distal internodes longer with tubular sheathing bracts. *Sheathing bracts* obtuse-subacute, reddish brown, transparent, with persistent sessile glands which dry white. *Inflorescence* racemose, terminal, erect, 3-16 flowered, lax. *Floral bracts* ovate-oblong, persistent, shorter than or exceeding the pedicels; margins entire, brown, white dotted, glabrous, acute. *Flowers* suberect, tubular, slightly curved, white, glabrous. *Pedicels* glabrous. *Ovaries* obovate (in flower), triangular in cross section, sparsely gland-dotted. *Sepals* connate into a tube, 3-lobed at the mouth; tube triangular; apex oblique, crisped, 3-4 nerved; dorsal sepal lobe ovate, slightly hooded, margin crisped at the apex. *Petals* inserted in the tube, alternating with the sepal lobes, obovate, apex obtuse, margins fimbriate, 1-nerved. Labellum free, equal or slightly exceeding column, ovate, acute, margin irregularly, finely denticulate, 5-nerved, with two conspicuous, parallel lamellae towards the apex and two reniform calli towards the base. *Column* short, winged, apically lobed with two erect, acute teeth. *Anther* terminal, 2-celled. *Pollinia* granular. *Stigma* basal. *Capsules* suberect, obovoid, fusiform, faintly verrucose, dehiscing by six longitudinal sutures. *Seeds* linear, fusiform.

Leafless mycoheterotrophic terrestrials with the habit of *Gastrodia*. Rhizome cylindric, villous, with roots arising from apex. Inflorescence few-flowered on an erect slender scape. Sepals adnate into a tube, apex free. Petals adnate to the sepals. Lip adnate to the base of the column, entire, base bicallose. Column slender. Anther subquadrate, 2-celled.

Distribution: Restricted to areas throughout SE Asia extending into Malesia.

Species:

Leptogastrodia dyeriana **(**King & Pantl.) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia dyeriana* King & Pantl., *J. Asiat. Soc. Bengal*, Pt. 2, Nat. Hist. 64: 342 (1895).

Leptogastrodia exilis **(Hook.f.)** M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia exilis* Hook.f., *Fl. Brit. India* 6: 123 (1890).

Leptogastrodia grandilabris (Carr) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia grandilabris* Carr, *Gard. Bull.* Straits Settlem. 8: 179-180 (1935).

Leptogastrodia flavilabella (S.S.Ying) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia flavilabella* S.S.Ying, *Quart. J. Chin. Forest.* 17: 83 (1984).

Leptogastrodia fimbriata (Suddee) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia fimbriata* Suddee, *Harvard Pap. Bot.* 9: 435-437, f. 1-2 (2005).

Leptogastrodia gracilis (Blume) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia gracilis* Blume, Mus. *Bot.* 2: 174 (1856).

Leptogastrodia huapingensis (X.Y.Huang, A.Q.Hu & Yan Liu) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia huapingensis* X.Y.Huang, A.Q.Hu & Yan Liu, *Phytotaxa* 222: 290-294, f. 1-2 (2015).

Leptogastrodia kachinensis (X.H.Jin & L.A.Ye) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia kachinensis* X.H.Jin & L.A.Ye, *PhytoKeys* 94: 23–29. https://doi.org/10.3897/ phytokeys.94.21348 (29 Jan. 2018).

Leptogastrodia longitubularis (Q.W.Meng, X.Q.Song & Y.B.Luo) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia longitubularis* (Q.W.Meng, X.Q.Song & Y.B.Luo, *Nordic J. Bot.* 25: 23 (2007 publ. 2008).

Leptogastrodia major (Aver.) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia major* Aver., *Rheedea* 16(1): 7, f. 3h, 5, 7a,b (2006).

Leptogastrodia menghaiensis (Z.H.Tsi & S.C.Chen) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia menghaiensis* Z.H.Tsi & S.C.Chen, *Acta Phytotax. Sin.* 32: 559-560, f. 1, 1-4 (1994).

Leptogastrodia peichatieniana (S.S.Ying) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia peichatieniana* S.S.Ying, *Coloured Ill. Indig. Orchids Taiwan* 2: 690 (1987).

Leptogastrodia punctata (Aver.) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia punctata* Aver., *Rheedea* 16(1): 7-10, f. 6, 7c,d (2006).

Leptogastrodia putaoensis (X.H.Jin) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia putaoensis* X.H.Jin, *Nordic J. Bot.* 35: 730-732 (2017).

Leptogastrodia taiensis (Tuyama) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia taiensis* Tuyama, *J. Jap. Bot.* 17: 579-580, f. 1 (1941).

Leptogastrodia wuyishanensis (Da M.Li & C.D.Liu) M.A.Clem. & D.L.Jones, ***comb. nov.*** Basionym: *Gastrodia wuyishanensis* Da M.Li & C.D.Liu, *Novon* 17: 354-356, f. 1 (2007).

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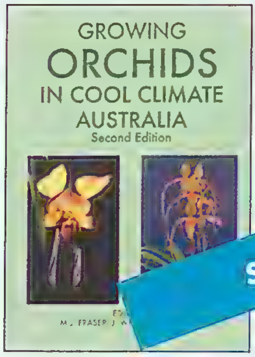

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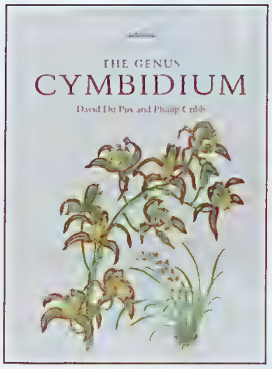

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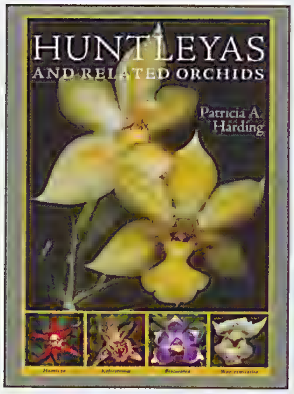

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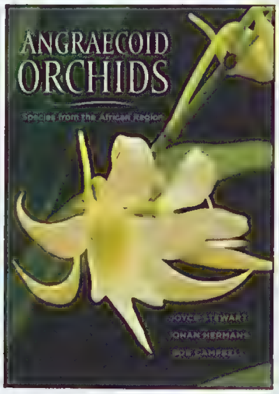

ANGRAECOID ORCHIDS:

Species from the African Region

by Joyce Stewart, Johan Hermans, and Bob Campbell

These so-called 'Jewels of Africa' with their sparkling flowers, distinctive growth habit and floriferous nature are much prized and this account, the first to include the Angraecoid orchids of both Africa and Madagascar, is long awaited. It brings together, in a single volume, descriptions of all 690 species in this intriguing group of orchids and will be the essential reference for all Angraecoid orchid enthusiasts for years to come. Including such horticulturally important genera as *Angraecum*, *Aeranthes*, *Aerangis* and *Jumellea*. Stewart, Herman and Campbell have all spent time in various parts of eastern and southern Africa and precise ecological information relating to habitat, altitude preferences and flowering season of individual plants will be particularly helpful to growers. The diagnostic features of each genus are illustrated and over half the species are accompanied by exquisite photographs taken in both wild habitats and in cultivation.

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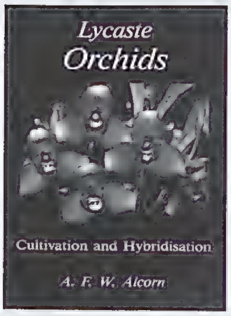

LYCASTE ORCHIDS - Cultivation and Hybridisation

by A.F.W. Alcorn

Lycaste orchids are easy to grow, and they produce flowers that range from the beautiful to the bizarre. No book previously has provided detailed cultural requirements of the Lycaste, and this book should fill that gap, and encourage new growers to take up the cultivation of this beautiful genus. A section on hybridising contains valuable information on inheritance and genetics that will benefit any hybridiser, not just the grower of Lycastes, as well as helpful hints on how to avoid pitfalls in your hybridising program. Michael Hallett, a friend of Fred Alcorn for a number of years, co-wrote this book with Fred and has completed it posthumously. He has a background in genetics, research and botany, and a passion for plants, especially orchids.

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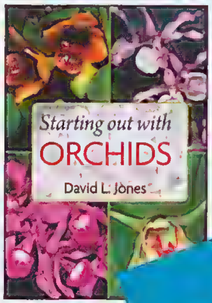

STARTING OUT WITH ORCHIDS

by David L. Jones

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David Jones is arguably one of Australia's most prolific, precise and respected botanical and horticultural authors. The book is divided in two parts. Part One begins with the cultivation chapters, covering Easy Orchids for Beginners, General Cultivation Requirements, Growing Epiphytic Orchids, Growing Terrestrial Orchids, Or and Diseases, Housing Your Orchids and Propagating information contained within these pages beginners through to experienced read and understand wi treatments discussed. There are illustrations that help describe terms or features. There are over 250 colour photographs.

discusses the orchids themselves with concise information on each species. They are rily according to climatic requirements, starting with cool growing orchids progressing to the warm wers, in alphabetical sequence first with terrestrial genera, followed by the epiphytes. Both Australian and exotic species are treated together. For each entry there is specific detailed information on each species, as well as a simple table giving the basic cultivation needs and flowering season. A glossary is also included to explain unfamiliar terms.

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February 24 Hills District Orchids
– Northmead Autumn Open Day
– Northmead, NSW

March 1-2 Queensland International Orchid Fair
– Beenleigh, QLD

March 9 Bellingen Plant Fair
– Bellingen, NSW

March 23-24 Bateman's Bay Workshop
– Bateman's Bay, NSW

April 6-7 Collector's Plant Fair
– Hawkesbury, NSW

May 11-12 Mothers Day Show
– Port Macquarie, NSW

May 11-12 Woodburn-Evans Head & District Orchid & Foliage Society Inc.
– Mothers Day Autumn Show
– Woodburn, NSW

May 17-19 Orchids Out West
– Hawkesbury, NSW

May 23-25 Casino & District Orchid Society
– Autumn Show
– St. Marks Anglican Church Hall, Casino, NSW

June 29-30 Mingara Orchid Fair & Show
– Mingara, NSW

July 13-14 Tinonee Orchids
– Workshop and Open Day
– Tinonee, NSW

July 28 Hills District Orchids
– Northmead Winter Open Day
– Northmead, NSW

August 10-11 National Orchid Extravaganza
– Dural, NSW

August 16-18 St. Ives Orchid Fair

August 31-Sept 1 Speciosum Spectacular
– Kempsey, NSW

Sept 7 Bellingen Plant Fair
– Bellingen, NSW

Sept 13-15 Woodburn-Evans Head & District Orchid & Foliage Society Inc.
– Spring Show
– Woodburn, NSW

Sept 19-21 Casino & District Orchid Society
– Spring Show
– St. Marks Anglican Church Hall, Casino, NSW

Sept 29 Hills District Orchids
– Northmead Spring Open Day
– Northmead, NSW

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March 1–2	Queensland International Orchid Fair – Beenleigh
March 9	Bellingen Plant Fair – Bellingen
March 23–24	Batemans's Bay – Workshop
April 6–7	Collector's Plant Fair – Hawkesbury NSW
May 11–12	Mothers Day Show – Port Macquarie NSW
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July 28	Hills District Orchids – Winter Open Day
August 10–11	National Orchid Extravaganza – Dural
August 16–18	St. Ives Orchid Fair
August 31–Sept 1	Speciosum Spectacular – Kempsey
September 7	Bellingen Plant Fair – Bellingen
September 28–29	Plant Lovers Fair – Kariong
September 29	Hills District Orchids – Spring Open Day
October 11–13	Southern Orchid Spectacular – Sutherland
November 2–3	Tweed District Orchid Fair – Tweed Heads
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